W. G. FARLOW

THE PLANT DISEASE BULLETIN

Issued By

The Plant Disease Survey

Number 1, August 15,

1917.

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

CONTENTS.

INTRODUCTORY STATEMENT.

The Plant Disease Survey was organized as an office of the Bureau of Plant Industry, United States Department of Agriculture, on July 1, 1917, with G. R. Lyman in charge, assisted by R. J. Haskell, formerly of the New York State College of Agriculture. The principal objects of the Survey broadly stated are: first, to collect information on plant diseases in the United States covering such topics as prevalence, geographical distribution, severity, etc., and, second, to make this information immediately available to all persons interested, especially to those concerned with disease control.

In collecting data it is proposed to utilize all available sources, both public and private, and to interest in this project all plant pathologists and all others who are in a position to report reliable information. We have already appointed one or more collaborators in each state, usually the plant pathologists at the Agricultural Experiment Stations. These collaborators will act as the leaders of the Survey work in their respective states, and correspondence relating to this work may be addressed to them or to the central office in Washington. A list of the collaborators acting as Survey leaders in their states is given below. Special field scouts will also be employed by this Office occasionally, to collect data on diseases of especial importance.

The Plant Disease Bulletin will be issued at frequent intervals during the crop season, and will contain summaries of all important data reported to this Office, thus making the information immediately available to all those interested in plant diseases and plant disease control. As the facilities for obtaining reliable and timely information are developed and extended the Bulletin will become of greater and greater value. It will be sent gratis to all our collaborators and correspondents and to others particularly interested in disease control work, who may request it.

PLANT DISEASE SURVEY COLLABORATORS.

Alabama: Dr. G. L. Peltier,
Agricultural Experiment Station, Auburn.

Arizona: Prof. J. J. Thornber,
Agricultural Experiment Station, Tucson.

Arkansas: Dr. J. A. Elliott,
Agricultural Experiment Station, Fayetteville.
Prof. J. Lee Hewitt,
State Plant Board, Fayetteville.

California: Dr. J. T. Barrett,
Agricultural Experiment Station, Riverside.
Prof. R. E. Smith,
Agricultural Experiment Station, Berkeley.

Colorado: Prof. H. E. Vasey,
Agricultural Experiment Station, Fort Collins.

Connecticut: Dr. G. P. Clinton,
Agricultural Experiment Station, New Haven.

Delaware: Dr. Thomas F. Manns,
Agricultural Experiment Station, Newark.

Florida: Prof. H. E. Stevens,
Agricultural Experiment Station, Gainesville.

Georgia: Dr. B. B. Higgins,
Agricultural Experiment Station, Experiment.

Idaho: Miss M. A. Willis,
Agricultural Experiment Station, Moscow.

Indiana: Prof. J. C. Arthur,
Agricultural Experiment Station, Lafayette.
Prof. H. S. Jackson,
Agricultural Experiment Station, Lafayette.

Iowa: Dr. L. H. Pammel,
Agricultural Experiment Station, Ames.

Kansas: Prof. L. E. Melchers,
Agricultural Experiment Station, Manhattan.

Kentucky: Prof. A. H. Gilbert,
State College of Agriculture, Lexington.

Louisiana: Dr. C. W. Edgecton,
Agricultural Experiment Station, Baton Rouge.

Maine: Dr. W. J. Morse,
Agricultural Experiment Station, Orono.

Maryland: Prof. C. E. Temple,
Agricultural Experiment Station, College Park.

Massachusetts: Prof. A. Vincent Osmun,
Agricultural Experiment Station, Amherst.

Michigan: Dr. Ernst A. Bessey,
Agricultural Experiment Station, East Lansing.

Minnesota: Dr. E. M. Freeman,
Agricultural Experiment Station, University Farm, St. Paul.

Mississippi: Prof. J. M. Beal,
Agricultural Experiment Station, Agricultural College.

Missouri: Dr. George M. Reed,
Agricultural Experiment Station, Columbia.

Montana: Prof. D. B. Swingle,
Agricultural Experiment Station, Bozeman.

Nebraska: Dr. E. Mead Wilcox,
Agricultural Experiment Station, Lincoln.

Nevada: Dr. P. A. Lehenbauer,
Agricultural Experiment Station, Reno.

New Hampshire: Dr. O. R. Butler,
Agricultural Experiment Station, Durham.

New Jersey: Dr. Mel T. Cook,
Agricultural Experiment Station, New Brunswick.

New Mexico: Prof. F. C. Werkenthin,
Agricultural Experiment Station, State College.

New York: Prof. H. H. Whetzel,
Agricultural Experiment Station, Ithaca.

North Carolina: Dr. F. A. Wolf,
Agricultural Experiment Station, West Raleigh.

North Dakota: Prof. H. L. Bolley,
Agricultural Experiment Station, Agricultural College.

Ohio: Prof. A. D. Selby,
Agricultural Experiment Station, Wooster.

Oklahoma: Prof. C. D. Learn,
Agricultural Experiment Station, Stillwater.

Oregon: Prof. H. F. Barss,
Agricultural Experiment Station, Corvallis.

Pennsylvania: Prof. C. R. Orton,
Agricultural Experiment Station, State College.

Porto Rico: Prof. J. A. Stevenson,
Insular Experiment Station, Rio Piedras.

South Carolina: Prof. H. W. Barre,
Agricultural Experiment Station, Clemson College.

South Dakota: Prof. C. W. Michel,
Agricultural Experiment Station, Brookings.

Tennessee: Prof. S. H. Essary,
Agricultural Experiment Station, Knoxville.

Texas: Dr. F. H. Blodgett,
Texas Extension Service, College Station.
Dr. J. J. Taubenhaus,
Agricultural Experiment Station, College Station.

Utah: Dr. G. R. Hill, Jr.,
Agricultural Experiment Station, Logan.

Vermont: Dr. B. F. Lutman,
Agricultural Experiment Station, Burlington.

Virginia: Dr. F. D. Fromme,
Agricultural Experiment Station, Blacksburg.

Washington: Dr. F. D. Heald,
Agricultural Experiment Station, Pullman.

West Virginia: Prof. N. J. Giddings,
Agricultural Experiment Station, Morgantown.
Dr. J. L. Sheldon,
Agricultural Experiment Station, Morgantown.

Wisconsin: Dr. L. R. Jones,
Agricultural Experiment Station, Madison.

Wyoming: Dr. Aven Nelson,
Agricultural Experiment Station, Laramie.

REPORTS

On August 1, 1917, a request was sent to all collaborators asking them to make a general report on plant disease conditions in their respective states and in addition to give specific information regarding certain diseases of potatoes, beans, winter wheat, rye, barley and corn. Special report blanks were provided for recording data on diseases of these crops. The questionaires on potato and bean diseases were sent to all states and those on diseases of cereals went only to states where the cereals are grown extensively.

SPECIAL REPORTS

BEANS

Anthracnose caused by Colletotrichum lindemuthianum.

Reports on bean diseases have been received from twenty-six states:

Alabama: First appearance in June at Auburn. Very prevalent, due to excessive rains during July. Most of the infection has appeared on the leaves. Bush varieties are most affected, pole varieties least.

Delaware: First appearance June 1 everywhere in the north central part of state. Disease mostly distributed in the northern part at the present time. Wax beans are most affected and green pole varieties, such as Kentucky Wonder and Limas, least affected.

Florida: The disease is prevalent in about the same amounts as last year. Definite data as to its occurrence this season has been secured from eight counties.

Louisiana: The disease is not abundant this year on account of the very hot dry weather during the growing season, in spite of the fact that much of the seed planted was quite badly spotted.

Maryland: Disease first observed early in April at College Park. More prevalent this year than usual. In some places it is quite severe. The unusually wet spring and summer has been largely responsible for the great loss this season. All varieties are affected.

Massachusetts: The disease first noticed on seedlings practically everywhere the crop is grown. At the present time it is generally distributed throughout the state but comparatively little damage has been done up to date. Since the development started the weather has been generally

dry and this seems to have checked the development of anthracnose to a large degree. Wax beans are most affected.

Michigan: Disease prevalent everywhere and in much greater quantities than last year. The wet weather with rains every two or three days have augmented the disease.

Minnesota: Disease first noted July 19 in Hennepin County. Anthracnose is not very common nor serious in the state this year. The spring was damp but the latter part of July has been dry.

New Hampshire: Disease first noted July 9 from Grafton County. Disease not serious owing to the dry weather of July.

New Jersey: There is less complaint than usual from growers in regard to anthracnose.

New Mexico: Disease first noted July 25 at Clayton, New Mexico. More prevalent than last year.

New York: First report of the disease June 25 at Saratoga Springs. Disease is very serious and it is estimated from reports sent in that about 31% of the crop has been injured. Nearly all of the specimens received showed leaf or pod infection. The wet cool spring followed by wet and warm summer appear to have been conducive to its development.

Pennsylvania: First noted early in July. Prevalent, at least in central part of the state. Not as severe as last year at this time.

Tennessee: Disease is general over the state, pod infection most common.

Vermont: Disease first noted June 17 in the vicinity of Burlington. It is common but not destructive as yet. Stem infection most frequently reported. Weather was favorable to its development up to June 15 but since that time it has changed and become unfavorable. Garden beans of the wax types, "navy" and "yellow eyes" are most affected.

West Virginia: Disease first noted July 25 at Morgantown. It appears to be unusually prevalent this season.

Bacterial Blight caused by Pseudomonas phaseoli.

Alabama: Disease first noted in May as occurring at Auburn. Scattered reports have been received as to its occurrence in other parts of the state.

Delaware: First noticed June 1 at Newark. Is very common on bush beans, especially the wax varieties. Pole and Limas are least affected.

Florida: Disease about the same as last year. Definite reports from three counties. Most injury has been to the foliage.

Louisiana: First noticed in April at many places in the state. Everywhere common but in about the same amount as last year. Much of the seed is infected. All varieties are reported as being diseased. Very hot dry weather did not seem to check the trouble but probably made it worse.

Maryland: First noted in April at Riverdale. More prevalent than last year. Many plants were killed in three weeks after they came up. 8% injury in infected fields. Golden Wax and Burpee's Stringless Greenpod most affected.

Massachusetts: First reported at Amherst and is now generally distributed throughout the state. Much poor seed was planted owing to the shortage. The injury up to the present time has been slight.

Michigan: Disease prevalent everywhere throughout the state. First appeared on seedlings. Seed for many fields was clean-picked but probably every lot of seed planted carried the organism. The injury thus far has been a killing of the lower leaves.

Minnesota: Disease first noticed June 12 in Hennepin County. Chief injury so far reported is a killing of the seedlings as they came up. Some fields were entirely destroyed in this way. Definite reports are available from only two counties.

New Hampshire: Disease first noticed July 9 in Grafton County but not severe.

New Jersey: Disease not abundant but more so than last year. Most of the injury has been to the seedlings.

New York: First reported July 15 at Spencer, probably in all bean growing sections. It is estimated from figures sent in by crop disease reporters that 2.2% of the beans have been injured.

Tennessee: Disease first reported in June from Jefferson City where it was occurring on leaves and pods. No estimate is made as to the amount of damage.

Vermont: Disease first reported June 17 from Burlington. It is common locally around Burlington on garden and field beans. More prevalent than last year. The seed planted was very clean as most of it was of local origin.

Wisconsin: Disease occurring in small amounts in Portage County. Injury to cotyledons and leaves.

Rust caused by *Uromyces appendiculatus*.

The disease has been reported by collaborators in the following states: Alabama, Louisiana, Maine, New Mexico, New York, North Carolina, Virginia and West Virginia. In West Virginia the disease is reported as being very prevalent and fully as destructive as anthracnose.

In New Mexico it is reported as being very prevalent in Chaves County. Most fields in that region are affected and some farmers will lose their entire crops through the ravages of the disease.

In Louisiana the disease is reported as being bad on pole beans and it prevented the development of navy beans in some cases.

In Alabama it was most severe on wax varieties.

In other states the amount of injury is small.

Stem Rots caused by Various Organisms.

In Alabama Sclerotium rolfsii is causing a good deal of damage on low lands.

In California stem rots, due principally to Rhizoctonia and Fusaria, are abundant.

In Florida stem rots occur everywhere in the state and are sometimes very serious.

In Louisiana and Michigan Rhizoctonia is said to be responsible for the dying of a great many plants.

In New York a root rot caused by Fusarium sp. is very serious this year as it has been for the past few years in nearly every bean field in the western New York bean-producing sections.

In New Hampshire Thielavia stem rot has been found, and in Vermont a Fusarium stem rot has recently been discovered. Some damage of this nature is being reported from Massachusetts.

Mosaic.

Mosaic is listed as occurring in Arkansas, California, Michigan, Minnesota and New York. It is said to be of little importance in all states except New York where it appears to be doing considerable damage.

Other Diseases.

In Arkansas a stem rot caused by Phoma sp. has been observed on one variety in one field where it was quite prevalent. Delaware is the only state reporting downy mildew caused by Phytophthora phaseoli. Nematodes are doing a great deal of damage to beans in Alabama this year as usual.

BARLEY

Leaf Rust caused by Puccinia simplex.

This rust has been reported as occurring in Minnesota, Virginia, Wisconsin and Wyoming this year.

Loose Smut caused by Ustilago nuda.

Reported from Idaho (1/3%); Michigan, Minnesota (in small amounts); New York (1/2 to 8% loss in individual fields); Pennsylvania, Vermont (very common); Wisconsin, Wyoming (1 to 2% in many fields).

Covered Smut caused by Ustilago hordei.

Reported from Michigan, New York (1/2 to 4% loss in individual fields); Pennsylvania, Vermont, Wisconsin and Wyoming (1 to 5% in many fields).

Stripe Disease caused by Helminthosporium gramineum.

Reported from Idaho (2 plants); Michigan, Minnesota (scattered amounts); Pennsylvania (noted at State College, prevalence unknown); Wisconsin "(1 to 36% in many fields, disease seems to be increasing in importance. Very limited number of fields in the valley sections are free from the disease. We are recommending soaking seed for 2 hours in formaldehyde solution at the rate of 1 pint to 30 gallons... --R. E. V.)"

Net Blotch Disease caused by Helminthosporium teres.

Reported from Michigan, Minnesota (moderate); Wisconsin (general).

Spot Blotch Disease.

Reported from Minnesota (slight).

Disease caused by Rhynchosporium graminicola.

Reported from Michigan, Minnesota (collected this year, not considered serious); Wisconsin (caused premature death of leaves in some fields); Idaho (not found this year but prevalent in 1915 and 1916 when it affected about 5% of the plants in some fields.)

CORN

Physoderma Disease caused by Physoderma zeae maydis.

This disease was first reported as occurring in the United States by J. T. Barrett from Illinois in August, 1912. As far as we know this is the

only report of its occurrence in that state. Redently it has put in its appearance in the southeast where it has increased rapidly and is apparently doing much damage, just how much is undertain. It is now known to occur in the states of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi and Tennessee. Mr. W. H. Tisdale, of the Bureau of Plant Industry, is in the field working on the trouble. Indications are that the disease is spreading rapidly and no one knows how disastrous it may become. The present distribution is undertain. The attention of the pathologists is drawn to Physoderma at this time in order that they may be on the lookout for it. The Plant Disease Survey Office has a limited amount of material and will be glad to send a specimen to those who request it. The Survey would like to receive notice of any new occurrence of the disease.

The following reports have been received from collaborators in states where the disease exists:

Alabama: First appearance in April at Auburn. The disease is everywhere present in the state, especially on bottom corn and is apparently increasing in amount. Corn grown on low land appears to be most affected. "I have just returned from a trip through the southern and central part of the state and find the Physoderma disease of corn is very common indeed. In fact I was able to find it in every corn field I visited. Mr. Williamson, of the Department of Agriculture, has just returned from the northern part of the state and he reports that he found it everywhere present.....
.....
In talking with one of our district agents yesterday he stated that he had observed this disease ten to thirteen years ago on bottom land. He stated that as far as he could see it caused no damage. Just how much damage does this Physoderma disease of corn cause? — G. L. P. "

Florida: First appearance May 16, observed by Sherbakoff and Tisdale. It is very common, but no definite data as to amount of damage. Apparently the disease is increasing in the state. It has been observed mostly on comparatively low land.

North Carolina: First appearance June 1 at West Raleigh, observed by Wolf and Tisdale. Wolf has visited several regions and found it everywhere present and increasing in amount in the state. No relation appears to exist between elevation and the amount of disease.

South Carolina: Disease first noted July 1 at Clemson College. Has been observed by everyone who has looked for it. Barre has found it in every section of the state and in every field examined. The amount of damage is considerable. Stalks in many fields are rendered entirely fruitless. No counts or accurate percentages are worked out but roughly there is a 25% loss in some fields. The disease is increasing in the state. There seems to be no relation between elevation and the amount of disease this season. Barre considers this one of the most serious diseases with which farmers in South Carolina have to contend.

Tennessee: First found in July occurring on southern border of state, Fayette County.

POTATOES.

Late Blight caused by Phytophthora infestans.

The cool and wet weather of May, June and July was favorable for the development of Phytophthora on potatoes. In the southern potato-growing states it has been very destructive, having become serious at about the time the early crop was maturing. Reports from Florida, Alabama and North Carolina show the disease to have been unusually severe on early potatoes. In some places the crop was reduced 50% while in a few fields there was a total loss.

Farther north the fungus is abundant at this time. In West Virginia it is stated that the disease is just getting well started but even now some fields are past redemption.

In the northeastern states the fungus appears to be widespread but has been checked by the dry and hot weather of the present month. Farther west little damage to the potato crop has been reported up to the present time.

On account of the prevalence of the fungus in the eastern part of the late potato belt, a serious development of the late blight may be expected provided the weather becomes favorable for the growth of the fungus.

The following more detailed information regarding the occurrence and prevalence of late blight has been sent in by collaborators.

Alabama: Late blight first appeared in April in Baldwin County. It was very bad in the Gulf Coast Section where the crop is in some places reduced one-half.

Florida: Disease first noted April 2 at Hastings, definite records being received from three different counties and it was found in some cases that 50% of the potatoes were killed. In affected districts there was about 20% crop reduction in unsprayed fields.

Maryland: The disease was first observed August 1, in Garrett, Allegheny and Washington Counties. It is not prevalent as yet. The blight-infested region has been relatively dry during the past two weeks but there is a sufficient amount of the fungus to cause an epidemic if weather conditions should favor.

Massachusetts: Disease first reported July 25 from Marthas Vineyard. It is also doing much damage on the Island of Nantucket and along the coast as well as being generally scattered in other places. A general epidemic is looked for provided weather conditions favor.

Minnesota: Disease first noticed July 13 in St. Louis County. It has also been reported from the counties of Pine and Benton. At the present time however, the blight is not prevalent nor severe.

New Hampshire: The disease was first noticed July 28 in Merrimac County. It is not as yet seriously prevalent, being checked by dry weather but is more abundant than last year.

New Jersey: First noted about July 15 in northern half of state but very little damage is being done as yet.

New York: The disease was first reported June 20 from Suffolk County, Long Island. It has also appeared in the counties of Genesee, Tioga, Caroline, Chenango, Orange and Columbia. It is not well enough started yet to do much damage but there is a great possibility of the development of an epiphytotic either in the next ten days or two weeks.

North Carolina: Blight is reported as being very destructive to the early crop in this state. Some fields showed a total loss and one man is reported as losing 100 acres.

Ohio: Disease first discovered July 24 at Wooster, although present at least one week earlier. The infestation appears to be localized in Wayne County. The disease has been checked by the hot, dry weather.

South Carolina: Disease reported from several places in Horry County. No indication is given as to the amount of damage.

South Dakota: Very little of the disease has been found and in such small amounts as to be insignificant. Season very cool and backward.

Vermont: Disease first reported July 9 in the vicinity of Burlington where it appears to be common. It has not as yet caused much damage but may be found in a majority of the plots. Weather conditions have been very favorable at times but lately it has turned hot and dry. If the weather should become humid an epidemic is feared because of the widespread initial infection.

West Virginia: Disease first noted July 19 at Philippi and has also been reported from Randolph and Barbour Counties. The disease is very general and just getting under way in most fields but some are severely damaged. The weather has been warm with much rain. Prospects for a severe epidemic are very good as but little spraying is being done and that not carried on efficiently.

Wyoming: In this state the disease has been reported once as occurring in Fremont County. It appears to be of very little importance thus far.

Potash Hunger.

This disease has been reported from a large proportion of the eastern states where commercial fertilizers are used. Definite reports have been received from Delaware, Maryland, Massachusetts, New Jersey, New York and Virginia. In the latter state McClintock reports the disease to be very general throughout the tidewater section wherever potash or stable manure are omitted. First noted early in May. An average of 10% injury is estimated.

There is much to be learned about this disease which has recently put in its appearance. Any data that collaborators may be able to furnish regarding the correlation of its occurrence with such factors as soil type, soil treatment, elevation, etc., should be made public as soon as possible.

Rhizoctonia Injury caused by Rhizoctonia solani.

It is to be noticed that this year when weather conditions have been optimum for the normal and healthy growth of the potato plant that Rhizoctonia injury is not as frequent as usual, this in spite of the fact that a large amount of seed was planted this season that bore the sclerotia of the fungus. Reports received from the collaborators show the disease to be doing less damage than usual, or at least no more than is common. In Vermont the disease is reported as being very scarce. It is reported from practically all states from which replies regarding potato diseases have been received. The injury reported at this time is mostly in the form of lesions on sprouts.

Mosaic (Cause unknown).

This disease is reported as occurring scatteringly in the following states: Alabama, Delaware, Florida, Louisiana, Maryland, Massachusetts, Michigan, New Jersey, New York, New Hampshire, Vermont, Virginia, Wisconsin. In most of these states the disease appears to be doing very little damage but in Florida it is reported that there have been cases this season where it caused 30% loss. In New York State on Long Island the disease is quite severe. Early in the season it was reported that a number of Long Island farmers were plowing up their fields on account of the trouble. Collaborators list the varieties Green Mountain, Irish Cobbler and Bliss Triumph as the ones affected. In practically all cases the disease appeared on potatoes grown from northern seed.

Common Scab.

Reports have been received from some states where the early potato crop has been harvested that indicate the prevalence of common scab. In Louisiana the disease was very bad. In one parish one-third of the potatoes were sold for seconds and culls on account of the disease. In Alabama scab was severe in spots but it is stated that most potato growers are now treating their seed. In Virginia the disease is quite abundant on some farms, especially where stable manure is used.

Early Blight.

This disease has been reported as being prevalent in the following states: Alabama, Louisiana, Massachusetts, Minnesota, New Jersey, Ohio, Pennsylvania, Virginia and West Virginia. In the latter state it is said to be very destructive in several plots. In Virginia it is reported as coming late in the season on the spring crop. In Pennsylvania and West Virginia it appears to be quite destructive while in the other states it is only somewhat so.

Black Leg.

According to reports this disease is quite prevalent in the following states: Delaware, Michigan, Minnesota, New Hampshire, New York, Ohio, Penn-

sylvania, Virginia and Wisconsin. In some of these states a considerable amount of Canadian potato seed have been planted this past season and in a great many of these fields the disease is very abundant. In some fields the stand has been reduced one-half. In Wisconsin many fields were noted in different counties where there was a 5% loss. The disease appears to be traceable to northern grown seed.

Tip Burn.

Tip burn is reported as being very abundant in Minnesota, New Jersey, New Hampshire, New York and Ohio on late potatoes. The occurrence of the disease is doubtless related to the hot, dry period of late July.

Fusarium Wilt.

This disease is reported from Arkansas, Delaware, New Mexico, Pennsylvania, Tennessee, Vermont and Wyoming.

In New Mexico it was first noticed July 15 in Grant County. It appears to be more prevalent there this year than usual and is spreading each year. Torrence County, New Mexico, is almost free from potato diseases this season due largely to cooperative efforts along the lines of seed treatment and seed selection largely directed by the county agent. In Wyoming the disease at present is showing up throughout the state. One field showed 10% of affected plants.

Germination Troubles.

Weak germination, either by the production of spindling sprouts or secondary tubers, has been reported as being unusually prevalent this year. Definite reports have been received from Maryland, Michigan, Minnesota, New York and Vermont. This germination trouble seems to be related to the unfavorable weather conditions that existed last season during the time when the crop was maturing. In Vermont it is estimated that the crop will be cut from 5 to 10% on account of this trouble.

Sclerotium Wilt caused by Sclerotium rolfsii.

This disease has been very serious in Alabama and Louisiana this season. In Alabama it is considered to be one of the most important troubles occurring in the Gulf Coast section. It caused a dying of the vines and a stem-end rot of the tuber. At some of the loading stations in June a number of bags of potatoes were rejected and it was necessary to regrade a great many lots.

In Louisiana there is more trouble than usual on account of this disease because more potatoes are planted on alluvial soils where the fungus is more abundant.

Other Diseases.

Nematode injury is very severe in certain localities in Alabama.

A Phoma disease has been noted at Amherst, Mass., by pathologists at the Experiment Station.

Bacterial blight, caused by Bacillus solanacearum, has been reported from several places in North Carolina where it rotted the tubers in the ground.

D. C. Babcock in Ohio has collected a new leaf spot and roll which he ascribes to be due to Verticillium albo-atrum.

In Idaho Miss Willis has received specimens that showed dead spots in the pith and which in many ways resembles what is known as "streak disease."

RYE.

Questionaires regarding rye diseases were sent to the principal rye-producing states.

Smut caused by Urocystis occulta.

Michigan: Urocystis occulta has been collected from several places this season, doing no more than 1% damage. It was first collected July 14 at Grand Rapids.

Minnesota: Generally prevalent in small amounts on winter rye. First appearance June 8 in Ramsey County. Few control measures are practiced by growers.

New York: Only two correspondents have reported rye smut this year. First report July 16 from Livingston County.

Ohio: First appearance July 18 in Highland County.

Tennessee: Disease observed at Knoxville and Jackson.

Wisconsin: First appearance July 15 in Washara County.

Ergot caused by Claviceps purpurea.

Michigan: First appearance July 14 at Grand Rapids. Disease common this year, especially on volunteer rye. Its prevalence is probably the aftermath of the comparatively large amount of ergot which developed last year under similar favorable conditions. So far no loss to animals from ergot has been reported to the pathologist at the station.

Minnesota: First appearance July 17 from Anoka County. Common in rye fields but no very appreciable loss.

New York: Reported July 21 from Alleghany County where 20% of the heads were affected. Only report received up to this time.

Tennessee: One report from Newport, Tennessee.

Wisconsin: First appearance July 15 at Madison. Quite abundant this season but losses are difficult to estimate. In many fields nearly every head has one or more sclerotium.

WINTER WHEAT.

Bunt caused by Tilletia foetens, T. tritici.

The reports received indicate that this disease is about as prevalent as usual. In some states it seems to be generally spread through entire wheat-growing regions, in others more or less centralized in various places.

Delaware: The disease is occurring in about the same amount as last year and appears to be distributed all over the state. Manns estimates about 1% loss from the disease.

Idaho: A little of the disease occurs everywhere that wheat is grown although it may be possible that it is doing much greater damage in some localities than others. It appears that mountain valleys and irrigated regions where summer fallowing is not practised are practically free from smut. In the semi-arid regions, however, where summer fallowing is practised the greatest losses from the disease occur. Practically all Idaho farmers treat their wheat seed.

Maryland: In Cecil County some very bad cases have been observed. One field was found that showed 20% smutted heads. In other sections of the state however, particularly in Washington and Frederick Counties, the wheat is of good quality and practically free from bunt.

Michigan: The disease is extremely prevalent in the state this year. It is estimated by Coons that the wheat crop will be cut 5% short on account of this disease. Coons finds that in the variety Red Rock there is an average of 2% bunt this year. It appears that when this strain was originally sent out it was healthy but became diseased so that at present it is difficult to find a single unaffected Red Rock field.

New Mexico: The disease is about the same as usual and no wheat-growing region appears to be free from it.

New York: In New York reports have been received from disease correspondents in the field which showed that counts for percentages of disease have been made in 132 fields. From these figures it is found that there is an average of about 1% loss in the wheat-producing counties of New York. It appears that there is much need of extension work along the line of seed treatment as the seed for only 9 fields out of the 132 was treated. Most of the treated fields showed no smut.

North Carolina: Disease generally present in the Piedmont and mountainous sections.

Ohio: Disease about the same as last year and ocurring in spots all over the state.

Tennessee: Reports the occurrence of bunt.

Virginia: The disease seems rather generally prevalent as usual. Only one case of severe injury has been reported.

Bureau of Plant Industry: In a recent field trip Alden A. Potter visited wheat fields in Michigan, Kansas and Nebraska and found bunt to be rather generally distributed throughout these states. In the two latter states it was prevalent, doing approximately 1% damage. In Michigan Potter and Coons had an opportunity to observe both Tilletia foetens and Tilletia tritici growing in the same fields. They made a rather close study of the symptoms of the two diseases and found enough difference in the pathological morphology to be able to distinguish the two. The differences were principally those of height and appearance of the spikelets.

H. B. Humphrey has recently received reports from the Pacific northwest stating that in eastern Washington and northern Oregon there appears to be little or no bunt in spring wheat but from 3% to 30% in winter wheat. In western Washington where the greater part of the seed is treated there is little or no bunt except in fields of untreated seed. In the wheat fields of Wisconsin Humphrey found practically no smut when he was there this season.

Loose Smut caused by Ustilago tritici.

Reports received regarding the prevalence of loose smut show that it is in about the same amounts as usual. Comparatively few reporters have attempted to estimate losses but some have done this quite satisfactorily.

Maryland: Temple estimates a 5% loss by actual count of from 5 to 1000 heads in each of several fields in four counties.

New York: There is approximately 1% damage, the figures being based on reports from about 30 plant disease correspondents.

Virginia: According to Fromme the disease is generally prevalent, causing from 5 to 10% loss.

Ohio: Disease reported more prevalent than usual.

South Carolina: More prevalent than usual.

Additional reports as to the occurrence of loose smut have been received from Delaware, Idaho, Michigan, Minnesota, North Carolina, Pennsylvania, Tennessee, West Virginia and Wisconsin.

Bureau of Plant Industry: A. A. Potter found the disease to be general in Nebraska and Kansas, doing a small amount of damage but in a few fields the amount of loose smut was found to be as high as 10%.

Scab caused by Fusarium culmorum.

Wheat scab seems to be especially prevalent and unusually severe this year probably on account of the rainy season which preceded harvest.

Delaware: Disease is very common, there being one or more percent loss.

Maryland: It is reported as occurring on wheat to the extent of 3 to 5%.

Michigan: The disease has been observed on wheat, barley and rye, causing 10% loss in some cases. Not yet observed on oats in this state.

Minnesota: It has been reported from five counties on wheat but definite data as to the amount of damage is not available.

New York: The disease has been reported five times this season. This indicates it to be much more severe than usual in the state.

Ohio: Disease occurs generally on wheat and locally about Wooster on oats and rye. Infected heads range from 1 to 28% by actual count.

Pennsylvania: There appears to be a decided increase of Fusarium culmorum on wheat and rye. Kern adds that this disease has not been considered prevalent in years past.

West Virginia: There is a considerable amount of the trouble but Giddings does not consider it to be causing a great amount of damage.

Wisconsin: The disease is reported to be limited in its occurrence.

Bureau of Plant Industry: Dr. H. B. Humphrey reports the disease as occurring also in Indiana and Illinois on wheat. In the latter state it is doing a great deal of damage to oats and rye also. In some sections 10% of the wheat is affected.

Leaf Rust caused by Puccinia triticina.

In answer to the question as to whether or not this was considered to be a disease of economic importance in the state, collaborators in the following states have replied im the affirmative: Maryland, North Carolina, Pennsylvania, South Carolina, and Tennessee.

Maryland: Temple states that in Maryland there are many cases where all the foliage dies prematurely, making the heads light and chaffy.

South Carolina: Barre adds that it was present all winter and when the warm spring weather set in the rust became very severe. In the state

it is stated that the disease frequently destroys all the leaves before the grain is matured as it did in many cases this season.

Tennessee: Essary considers leaf rust to be of very great economic importance.

Other collaborators either consider it to be of no importance or at least not doing much if any damage.

Yellow Stripe Rust caused by Puccinia glumarum.

According to Dr. H. B. Humphrey a new eastern limit has been established for this rust. Heretofore the eastern limit has been a north and south line passing through Sheridan, Wyoming. This season a serious outbreak has been found on barley in the Black Hills of South Dakota. The only other reports received thus far this year of the occurrence of this disease have been from the Williamette Valley, Oregon, Oregon River, Oregon, Sherman County, Oregon, and Moscow, Idaho. In the latter place it was found by Miss M. A. Willis. She says "I have searched diligently for this disease in the vicinity of Moscow but have not found any on wheat, rye, or barley. I found it on one bunch of Hordeum jubatum. The largest leaves on these plants showed disease. It evidently had lived over winter on it. It has since spread to one other plant of this species. Between the grasshoppers last fall and the severe winter this rust has been almost killed out in this section."

Other Diseases of Wheat.

Black stem rust caused by Puccinia graminis has been reported as causing severe losses in many Michigan fields. Farmers in one county claim 15% loss. First reported from the Michigan Agricultural College May 20. The disease is also reported as causing considerable damage in Arkansas, Pennsylvania and Wisconsin.

Anthracnose caused by Colletotrichum cereale is reported from Ohio.

EXTRACTS FROM GENERAL REPORTS.

APPLE

Scab is reported as being unusually bad in Wisconsin, Ohio, Pennsylvania and New York. A large amount of the fungus over-wintering on the old leaves together with the wet spring made conditions favorable for initial infection.

Leaf spot caused by Physalospora cydoniae developed in excessive amounts in Ohio during July, and in Virginia it is very prevalent causing heavy defoliation in some orchards.

"Cedar rust has been unusually severe in the Upper Valley section of Virginia. Light infections were found in many places where cedars were thought to have been eradicated, but in places where no cedars have been removed the infections were so numerous that serious defoliation and loss seems inevita-

ble. The infection apparently took place very largely in one sporidial shower rather late in the season about June 1." F. D. F.

CHERRY AND PLUM.

Shot hole is unusually bad this year all over the state of Wisconsin where it started about July 1. Selby in Ohio and Coons in Michigan also report an excessive amount of this disease.

PEACH

Pennsylvania reports a considerable reduction in the crop throughout the state because of heavy blossom infection by Sclerotinia cinerea. Brown rot is also more destructive than usual on peaches in South Carolina. Scab is causing serious losses in every peach orchard in the latter state.

TOMATO

Florida: Members of the Office of Cotton and Truck Investigations have had occasion to study tomato diseases in Florida in the months of February, March and April. They have contributed the following notes:

"Alternaria solani on seedlings, foliage of large plants, and fruit. Observed at Miami and Bradentown, Florida. Extent of injury (approximation) 15-20%.

Phoma destructiva on foliage of large plants and fruit at Miami, Florida. Extent of injury about 5 - 10%.

Damping-off of seedlings in tomato seed beds due to Rhizoctonia. Observed at Miami and western coast of Florida. Extent of injury approximately 2 - 5%.

Fusarium wilt observed at Miami and all southern points. Extent of injury about 5%, with the exception of one small field where the injury was about 30%.

Mosaic observed on foliage of large plants at Miami and other southern points. Widely distributed.

Cladosporium fulvum observed in one large field in southern Florida, causing about 30% injury, leaves turning yellow and dropping. Yield from this field as compared with adjoining field reduced about one-third."

New Mexico: "The most important disease in New Mexico at present is the Fusarium wilt of tomato. This wilt has been reported so far from Valencia, Curry, Dona Ana and Grant Counties. In Dona Ana County about 80% of the tomato crop is affected and the estimated loss will probably amount to about 90% of the crop." F. A. W.

A new tomato disease somewhat like Fusarium wilt is serious in New Mexico and is being investigated.

North Carolina: "Reports indicate that bacterial wilt of tomato is more prevalent and destructive than usual, occurring throughout the state and in many cases destroying entire crop." H. W. B.

THE PLANT DISEASE BULLETIN

Issued By

The Plant Disease Survey

Number 2, September 1,

1917.

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

CONTENTS

REPORTS

The present number of the Plant Disease Bulletin is compiled from the following sources:

1. Reports of collaborators as to the status, on August 15, of the important diseases of cotton, sweet potato, flax, oats, and grape. Special forms were supplied for these reports. The one for oat smut was sent to all states while the other blanks were directed only to states where the particular crop was of importance.

2. Special reports from collaborators on diseases of potatoes, beans and wheat, as of August 1, received too late to be used in the August 15 number of the Bulletin.

3. Additional data gathered from various sources as to the present occurrence of certain diseases of economic plants.

SPECIAL REPORTS

ALFALFA

Phyllosticta medicaginis has been very severe this year in Idaho on alfalfa. It seems to be quite destructive in the state, causing losses varying up to 50%. In some cases there is almost a total loss. A large amount of winter killing has been reported from various places.

In some parts of south Idaho white leaf spot is prevalent on weak plants in old fields but it is not found in young fields to any extent. Bacterial stem blight is found in all parts of Idaho, causing more or less damage to the first crop each year.

APPLE

Further reports on apple scab indicate that the disease is very abundant in northern Idaho where control measures are not employed.

From Oregon Barss writes "Scab appeared on the foliage of apples and pears abundantly in the early part of the season in western Oregon but fruit infection will be much less than for the past two years on account of the fact, we think, that the season was a month late and dry weather came on quickly and remained without interruption. This allowed but a short period favorable for

scab infection and development. The disease is general but growers are becoming more expert at control of the disease." - H. P. B.

BARLEY

In eastern South Dakota there is about 1% of the Helminthosporium stripe disease. Some net blotch and spot blotch occur each year.

The Rhynchosporium disease is quite common in various parts of Oregon. The economic importance of the disease is questionable.

BEANS

Vermont: The bean yield will be cut to some extent as a result of the dry weather of the last days of July and those of the early part of August.

Anthracnose caused by Colletotrichum lindemuthianum.

Connecticut: First reported this season July 22 from four different places. Early in the season there was considerable complaint but not much lately. The seed used this season was not as good as the average on account of scarcity. Considerable stem infection. Varieties most affected Golden Wax; least affected, Hodson Wax.

Oregon: None found this year but in the past some has existed along the coast in unimportant quantities. The usually dry Oregon summers appear to be unfavorable for development of the disease.

Bacterial Blight caused by Pseudomonas phaseoli.

Michigan: "The indications are that bacterial blight of beans will be very serious this season. The combination of blight and wet weather during early summer will cause quite a shortage in the crop." From Michigan Department of Botany News Letter.

Oregon: Specimens of blight have been received at the Oregon Station from Hood River, Yamhill and Benton Counties. This is the first occurrence in the state as far as is known to men at the Station. In most all cases the source of the disease seems to be traceable to out of state seed. Oregon-grown seed is thought to be entirely free. No spread of the disease from affected to unaffected fields has been observed thus far. The total amount of blight is very insignificant.

Mosaic.

Oregon: "What appears to be a mosaic has appeared in various patches in different sections. How general it is we do not know. In some cases it is serious. Plants do not bear well if at all. The leaves are mosaic patterned and puckered. Plants are not greatly stunted although somewhat so at times." -H. P. B.

Other Diseases.

Texas: Principal trouble is leaf rust, especially serious in south-west section. 25-30% defoliation. Estimated loss 10%. Usually occurs in the dryer sections but is widely distributed on account of drought.

BEETS (Sugar)

Rhizoctonia Rot.

Michigan: "It is to be expected that the Rhizoctonia rot of sugar beets will be of wide occurrence this year. Specimens have been sent in from three counties." From Mich. Dept. of Botany News Letter.

COTTON

Anthracnose caused by Glomerella gossypii.

Alabama: 75% or more of the cotton growing area is overrun. Very little is done along the lines of control. Some resistant varieties are being grown.

Louisiana: Disease common but not so prevalent as usual due to the abnormally dry season. No control measures are being practiced.

North Carolina: Disease just beginning to manifest itself. It is probably quite general.

South Carolina: "Anthracnose was prevalent early in the season on seedling cotton and caused about the usual amount of damage at this time. The first report of disease on the bolls came in from Horrell Hill in Richland County on July 27. The specimens which were sent in indicate a serious outbreak as the small bolls were badly diseased. The weather has been especially favorable for anthracnose thus far (August 1). County agents are pushing control measures."- H. W. B.

Tennessee: Not observed this season. It is too early to expect it in Tennessee.

Texas: Very prevalent everywhere cotton is grown. It is estimated that there is about 20% loss this year. Seed treatment is being urged to some extent.

Wilt caused by Fusarium vasinfectum.

Alabama: The disease is very bad this year in regions where it occurs. The land is infested in practically the whole southeastern section of the state. There is probably no wide increase in the infested area over last year. Practically all the cotton raised in the southeastern part of the state is a resistant variety.

Louisiana: Disease extremely severe this year on infested land, it being much worse than usual. The infested area is large. Resistant varieties are being employed very little as there is no wilt-resistant variety that can be recommended for Louisiana conditions.

North Carolina: Complaints of the disease just starting to come in. Several county agents have cooperators who plant resistant varieties.

South Carolina: Disease common and in about the same amounts as usual. It is estimated that from 20,000 to 25,000 acres of land are infested with the organism. This season the area has increased from 5 to 10%. Resistant varieties are being planted on 12,000 to 18,000 acres.

Tennessee: Not troublesome in state.

Texas: Fairly prevalent this year, probably more than last. No resistant varieties being grown.

Potash Hunger caused by Lack of Potash.

Alabama: The absence of potash fertilizers has increased the loss from so-called "rust" to some extent. The disease is more or less restricted to what is known as the "Black Belt" in Alabama.

Louisiana: There is very little of the trouble in Louisiana soils as most of them contain sufficient potash.

Tennessee: Trouble of some kind has been reported from two counties, probably due to this cause.

Texas: No complaints of this trouble and none has been noticed.

Angular Leaf Spot.

Alabama: Disease very prevalent over state this season, due to the wet, rather cold spring and summer. Loss hard to estimate.

Louisiana: Disease just beginning. Dry weather prevented its development earlier.

North Carolina: No complaints have come in yet. Last year there were many reports.

South Carolina: Present in every cotton field. It was found on James Island causing serious damage to Sea Island cotton. Seasonal conditions are not as favorable for spread as last year. The disease reduces leaf areas to considerable extent and destroys bolls under certain conditions.

Tennessee: Disease is always present. It is hard to give an estimate of the damage done by it, but it is very considerable.

Texas: Very prevalent, accompanying anthracnose.

Root Knot caused by Heterodera radicicola.

Alabama: Found everywhere. Final results of a survey of the whole cotton area would show that the loss due to root knot surpassed the loss from all the other diseases of cotton combined.

Louisiana: Does not usually cause much damage.

South Carolina: Common and widespread. Nematodes cause considerable damage throughout the coastal Plain region and in many localities in the Piedmont district.

Tennessee: Not reported this year. Probably never very serious although it may have been overlooked.

Texas: Prevalent in some districts where wilt is found.

Other Diseases.

Texas: Texas root rot very prevalent in the black lands.

GOOSEBERRY

Powdery Mildew (Sphaerotheca mors-uvae).

New Mexico: It is reported that 75% of the gooseberries in Colfax County are affected with powdery mildew. Loss is very great this year. First time disease has been reported from Colfax County.

GRAPE

Anthracnose caused by Gloeosporium ampelophagum.

Reports of the occurrence of this disease have been received from only two states. Questionaires were sent to the twelve important grape-producing states.

North Carolina: "Disease everywhere present. About half the grapes in the college vineyard of several acres are rotten. This is typical of what I have seen elsewhere." -F. A.W.

New York: First appearance July 18 at Gilbertsville. Only two reports of the disease received thus far but one of these states that there is a 50% loss in one vineyard.

Other Diseases.

New York: Black rot has been reported twice, dead arm once, and downy mildew from three counties.

Ohio: A normal amount of black rot is present in most vineyards. The amount of powdery mildew is greatly increased. Some crown gall and dead arm.

Virginia: Quite abundant on several varieties at the Truck Station at Norfolk. It occurs on the fruit and leaves.

FLAX

Wilt caused by Fusarium lini has been about as prevalent as usual in Minnesota. First noted about June 15 on University Farm, St. Paul. It is very severe on soil that has grown flax for a number of years. Apparently selection of plants grown on wilt soil is the best control measure. Seed treatment and rotation are fairly effective.

Rust caused by Melampsora lini has not been reported as yet from the state of Minnesota where it is of occasional economic importance. Careful observational evidence seems to indicate quite clearly that the disease reduces the yield.

Canker is probably of minor importance since very little of the Minnesota flax crop is grown on dry land. Reported only once from the state this year.

MELON

Watermelon anthracnose caused by Colletotrichum lagenarium is reported by Mr. J. L. Seal in Barnwell and Oconee Counties, South Carolina, where it is

causing complete defoliation of the plants and is also attacking the melons. The disease is usually prevalent in all sections of the state and it is suspected as being widespread this season. No reports other than the ones mentioned have been received.

"Fusarium wilt of cantaloupes and melons is very common in Dona Ana County, New Mexico, and most fields seem to have some plants affected with this disease. The total loss for this year will not be very great, but I expect that by next year from 20 to 40% of the crop will be affected with the disease if the truck growers do not practice crop rotation. Isolated reports of the same disease have been received from Grant and Luna Counties." -F. C. W.

OATS

Smut caused by Ustilago avenae and U. levis.

Alabama: Disease somewhat worse than last year on account of the cold, wet spring. 25% of seed oats treated in state. Previous to a campaign conducted last fall less than 5% of the oats were treated. Whole state needs extension work along this line.

Colorado: There is a possible increase over last year with 2 to 10% loss in untreated fields. Only a few farmers are treating their seed, there being only about 7 to 9% of the oats treated last spring.

Connecticut: Oats not generally grown in the state. As a rule smut is not abundant enough to merit treatment. No complaints this year.

Indiana: More than last season, probably because of wet weather at planting time and after. Losses range from 0 to 14% in untreated fields. About 20% of seed oats in state treated. Demonstration work needed in non farm bureau counties.

Louisiana: Probably more smut this year than last. First appeared about last of April. Very little seed treatment done. Disease seems to be worse in the northern part of the state.

Maine: Does not seem to be quite as much as usual. It does considerable damage every year. Aroostook County is most in need of extension work in seed treatment on account of the large acreage grown in rotation with potatoes.

Michigan: Oat smut seems to be more prevalent than last year, perhaps on account of the wet spring. The percentage of smutted heads in untreated fields ranged from 10 to 30% with an average of nearly 15%. It is estimated that 25% of the oat seed was treated this spring. Extension work needed in non farm bureau counties.

Minnesota: Average amount of smut this year. First appeared about July 10. About 10% loss in untreated fields. Every county needs work along the line of seed treatment.

Missouri: Disease common. Treatment effective where used.

Nebraska: About the same amount as last year, with an average of approximately 5% smut in untreated fields. It is estimated that about 50% of the seed oats in the state were treated last spring. All counties where there are no county agents are in need of seed treatment demonstration.

New York: First appeared this season about July 16. From reports received from thirteen counties it is estimated that there is approximately 9% loss in untreated fields and ½% loss in fields where the seed was treated. It is further estimated that about 15% of the seed oats were treated this spring.

North Dakota: About the usual number of fields infested. Damage done is apparently lighter, probably on account of the dry weather at sprouting time. It is estimated that the loss in untreated fields ranges from 1-40%. 50-75% of the seed oats were treated. Most of the farmers in the state know how to handle seed treatment.

Ohio: Apparently less this year than last, due to the increased amount of seed treatment. First appeared about July 15. 2-5% smut in untreated fields. 25% seed oats treated last spring. Special efforts have been made by county agents to get farmers to treat seed. Literature from the Experiment Station and College of Agriculture has been freely used.

South Dakota: Scattering throughout the state but of extremely minor importance. Most farmers treat seed.

Tennessee: From 1-6% in 1916. About the same this year. First appearance about May 15. Extension work on seed treatment needed all over state.

Texas: Smut is increasing in amounts. Little seed treatment is done in the state. The Pan Handle section is most in need of extension work.

Vermont: 7% loss this year as compared with 12% last year. Difference due mainly to weather conditions. First appeared Aug. 1. Reports from county agents show that in one county 50% of the seed was treated. Practically all the larger growers treat their seed.

Virginia: Counts show an average loss of about 10% in untreated fields. Very small percent of oats treated. All counties need demonstration work along lines of seed treatment.

West Virginia: Disease apparently somewhat worse than last year. The matter of seed treatment has been taken up to some extent with county agents. Counties most in need of extension work on seed treatment are Randolph, Preston and Brooks.

Wisconsin: Prevalent in about the same amounts as last year, plus or minus 10% in untreated fields. Only a small percentage of seed oats were treated this spring in unworked territory. The county agents are handling the work very well in counties where there are farm bureaus. In some communities nearly everybody treats seed.

Other Diseases.

Bacterial blight of oats has done considerable damage in Idaho this season. One grower reports one-third loss.

Complaints of blighting of lower florets of the panicle are common in Pennsylvania. The trouble is thought to be due to anthracnose.

PEARS

Drought Injury.

Oregon: "Bartlett pears have been recently sent in from various places in southern Oregon, affected with a blackening at the blossom end. Sometimes the discoloration included a considerable portion of the fruit. There is a breaking down of the tissues immediately beneath the surface in the affected regions but the effect is that of a dry and not a soft rot. No parasitic organism is present and everything indicates it to be a result of weather conditions related to transpiration and moisture supply." -H. P. B.

POTATO

Late Blight caused by *Phytophthora infestans*.

Colorado: None reported as yet.

Connecticut: Disease first noticed July 24 at South Manchester. Has been seen thus far, August 15, only in two places and is present in only small amounts at the present time. The early summer weather was favorable for development but after the middle of July it became unfavorable with the result that the disease has been checked. The most of the damage that will be done now if the disease gets started will be in rotting the tubers or tops that are still green.

Maine: L. O. Kunkle, returning from an excursion to the Maine potato fields, reports that late blight is unusually prevalent in Aroostook County. Inhabitants say that the disease is the worst it has been in years. All varieties are being attacked and unsprayed vines are practically dead. Those fields that have been well sprayed are remaining green although there is more or less disease in them. The weather for the past few weeks has been unusually wet for northern Maine at this time of the year. It is estimated that the Aroostook crop has been cut 25% already on account of blight. Not much rot has developed thus far. Kunkle states that practically no *Phytophthora* blight could be found farther south in the vicinity of Portland and east into the state of New Hampshire.

"September 1. Late blight has appeared all over the state and is

more prevalent and destructive than it has been for years previous. Unsprayed or poorly sprayed fields have been killed. Even the best of the commercially sprayed fields show some to considerable blighted leaves. Rot in the field has already started where foliage has blighted worst. Continued cool cloudy weather practically the entire season has been favorable for the disease except in the southwestern part of the state where there has been less moisture. Blight was first noticed July 23 at Orono and Lincolnville." W.J.M.

Missouri: Very little reported.

North Dakota: No late blight has been observed or reported in the state.

Oregon: No late blight reported as yet. It was prevalent last year along the coast and in Multnomah County along the Columbia River. In general potato tops are small and prospects are for a very small yield and small sizes. The unusually late cold spring without much very wet weather followed by the long drought period with high temperatures early in July have been unfavorable for growth.

Pennsylvania: No late blight reported as yet.

Texas: Late blight was practically absent from the state on crop that has been harvested.

Tip Burn.

Connecticut: "Tip burn and prematurity of the vines is very bad in certain fields that lacked moisture. The three hot days during the last of July and first of August killed half the leaves in many fields. Late planted potatoes were least injured and certain localities helped to prevent injury in those places." -G. P. C.

Pennsylvania: Tip burn has developed considerably.

Vermont: "Tip burn on potato leaves has appeared in great quantity and will reduce the yield considerably. It seems to be worst in the Champlain Valley and in some fields has taken 50% of the foliage. The potatoes in the mountain regions were not as far advanced and were not hit so hard. I have had reports of it from all parts of the state. The dry, hot weather of the early part of the month checked fungous diseases that had started during July." B. F. L.

Powdery Scab caused by *Spongospora subterranea*.

An examination of Maine potato fields by L. O. Kunkle, of the Bureau of Plant Industry, has led him to believe that powdery scab will be common in Aroostook County this year. In infested fields the disease is just coming on the tubers. Rainy weather is believed to have been very conducive to infection.

Early Blight caused by Alternaria solani.

Michigan: The disease is causing considerable damage in Wexford and Missaukee Counties. In some fields near Cadillac as many as 70% of the plants were severely attacked.

Wilt Diseases.

Michigan: Fusarium wilt of potato is reported by Levin as especially severe near Detroit where it has considerably reduced the yield of the early crop.

Oregon: Wilt due to Verticillium albo-atrum has been encountered as early as July and appears to be reducing the yield to an appreciable extent in some fields.

RYE

Ergot caused by Claviceps purpurea.

Connecticut: Apparently more abundant than usual. Found at Storrs this year in amounts varying from 1 to 5%.

STONE FRUITS.

Peach Leaf Curl caused by Exoascus deformans.

New York: Leaf curl has been unusually severe in New York this season. Reports as to the prevalence of the disease have been received at Ithaca from 32 plant disease reporters in the state. 21 reporters state that there is more curl than last year, 5 estimate about the same amount, and 6 believe there is less. The records of less disease come from the larger peach-growing sections where spraying is becoming more efficiently practiced. The estimate of percentages of diseased leaves on affected trees show an average of 48% in all orchards. On unsprayed trees nearly 90% of the leaves were more or less curled and on sprayed trees the percentage of affected leaves varied from none to as much as 60%. More and more growers are taking up fall spraying in New York. The results of fall spraying this season were superior to those secured from applications in the spring.

The following tabulation of varietal susceptibility was prepared from reports sent to Collaborator H. H. Whetzel in New York by his reporters in the field:

Variety	Number of reporters listing variety as: Susceptible	Resistant	Variety	Number of reporters listing variety as: Susceptible	Resistant
Elberta	16	1	Triumph	1	0
Carmen	3	2	Early Crawford	0	4
Late Crawford	5	1	Fitzgerald	0	3
Champion	3	0	Salway	0	2
St. John	3	1	Crosby	0	1
Greensborough	2	1	Dewey	0	1
Belle	1	0	Hill's Chili	0	1

Oregon: "Peach leaf curl has appeared in its worst form in all parts of the state where spraying was not done. The long delaying of blossoming period kept the trees in a susceptible state for a longer period than usual. Proper spraying in the winter was just as effective as ever." -H. P. B.

Bacterial Gummosis caused by Bacterium cerasi.

Oregon: "This disease appeared this spring in the worst form in many years. A large amount of damage was done to trees of young bearing age, which is unusual. While sweet cherries were most commonly and seriously attacked, yet prunes and peaches suffered to an extent which we have never noticed before. The increased damage done this year is attributed to the fact that the trees had one month more dormancy in the spring ~~than usual~~ during which time temperature was high enough for bacteria to work." H. P. B.

,Drought Effects.

Oregon: "Drought effects or what appears to be abnormal conditions relating to evaporation and moisture supply balance are making themselves evident in many sections and in different fruits. Prunes are affected by the appearance of watery looking spots on the surface followed by the exudation of drops of gum under pressure from such spots on the fruit. The watery spots in the flesh are always accompanied by the death of a cluster of cells often of very slight extent in the region of the vascular net below the surface of the fruit. This phenomenon has occurred before but never has been more prevalent in all the prune sections of western Oregon. The total damage is not known. Continued dry, hot weather with frequent breezes is thought to account for this." -H. P. B.

Leaf Spot caused by Coccomyces hiemalis.

Oregon: The Cylindrosporium leaf-spot of prune which was so serious in central Willamette Valley last year is very inconspicuous this year.

Brown Rot caused by Sclerotinia cinerea.

Oregon: There is less evidence of this disease than has been seen for many years. Blooming time was followed by hot, dry weather that has been very unfavorable to development.

Virginia: Abundant near Norfolk on peaches.

Root Rot of Cherry.

Michigan: A root rot of cherry apparently due to a species of Thelephora has been brought to the attention of the plant pathologists at the Michigan Experiment Station.

SWEET POTATO

The first paragraph under each of the following sweet potato diseases were supplied by the Office of Cotton, Truck and Forage Disease Investigations. It is a general statement of occurrence and losses as far as present knowledge goes.

Stem-rot caused by Fusarium hyperoxysporum and F. batatatis.

Most prevalent in New Jersey, Delaware, Maryland, Virginia, Iowa, Kansas and Illinois, and locally in other states. Annual loss 5-10%.

Alabama: No observations. Never has been called to attention.

Louisiana: This disease was observed for the first time in the state when it was found in a field at Hammond, Tangipahoa County. It was brought in on cuttings from Georgia. The field was in bad shape.

New Jersey: Disease occurs in state everywhere sweet potatoes are grown.

North Carolina: The disease occurs in the state in the coastal plain area. It was plentiful last year but has not as yet been observed this season. No control methods are practiced.

South Carolina: Disease increasing in the state. This season it has been reported from Oconee, Newberry, McCormick, Greenwood, Saluda and Lexington Counties. Control measures are being employed only to a limited extent.

Tennessee: Disease occurs in state but does not cause serious loss. It has not been observed this year. It will probably increase in amount from year to year as sweet potatoes are grown continually on the same ground. No control methods are employed.

Virginia: Disease occurs in Accomac, Norfolk and Princess Anne Counties and may also be present in others. This year it has been observed at Lasley, Accomac County, and Diamond Springs, during July and August. Susceptible varieties are Little Stem Jersey and Big Stem Jersey. Little data have been collected as to the resistant varieties. Loss this year less than 2%. The disease is on the decrease (Va. Truck Exp. Sta. Bul. 22) Hill selection is being employed quite widely. This method has reduced disease from 90 to 2% in some cases.

Foot Rot caused by Plenodomus destruens.

Occurs in Virginia, Ohio, Iowa and Missouri. A serious trouble in Virginia, Ohio and Iowa. Annual loss in states where the disease occurs as high as 30%.

Tennessee: Does not occur.

Virginia (Truck Station): Disease occurs in Accomac, Norfolk, Princess Anne Counties. It may be present elsewhere. It has been known to growers on the eastern shore of Virginia for forty years. (First called to attention of science by Dr. Harter in 1912). The disease is not as abundant or serious this year as usual, probably due to the more general use of recommended control measures. In 1917 the highest counts thus far (August 15) have been 10% in one field. In 1915 and 1916 many fields showed over 50% foot rot. Big Stem Jersey practically only variety affected.

White Rust caused by Albugo ipomoeae-panduranae.

Common in Virginia, Maryland, New Jersey and Delaware. Usually common each year where sweet potatoes are grown. Annual loss probably 1%.

Alabama: Disease common but not very serious.

Louisiana: Not noticed this year as yet but it is always present and widespread but doing very little damage.

New Jersey: Disease has appeared this year but is of no importance.

North Carolina: Disease very general this season. It was bad last year.

Tennessee: Has not been seen this year. Is usually common but of little importance.

Virginia (Truck Station): Disease not as abundant as in 1916 when it was very prevalent. First appeared this year late in July. Disease is probably favored by cool moist weather although this point has not been definitely worked out.

Leaf Blight caused by Phyllosticta batatas.

Common throughout the South each year. Loss, if any, from the disease very slight.

Louisiana: Not noticed this season but is probably present. Every year it occurs but causes little damage.

New Jersey: Has appeared this year but is of no importance.

Virginia (Truck Station): Disease abundant this year. Not as prevalent in 1915 and 1916. Date of first appearance July 15. The large amount of rain was apparently favorable. Observed on all commercial varieties but most abundant on the Big Stem Jersey.

Leaf Spot caused by Septoria bataticola.

Virginia, Maryland, New Jersey, Delaware, Iowa, and locally in other states. Occurs each year and occasions no loss.

Alabama: Very common. First appeared July, 1917. Prevalent this year due to cold, wet summer. There appears to be some differences in the susceptibility of varieties to disease.

New Jersey: Disease has appeared this year but is of no importance.

Virginia (Truck Station): Disease quite abundant. Has been known to exist since 1912 at least. First appearance this year July 15. Excessive rainfall this year apparently favorable. Big Stem Jersey worse affected

Black Rot caused by Sphaeronema fimbriatum.

Occurs throughout the United States where sweet potatoes are grown. Annual loss 5-10%.

Louisiana: Black rot occurs to some extent every year but is usually not severe.

New Mexico: Black rot has been reported from Roosevelt County. No data available as to relative prevalence or loss.

North Carolina: Black rot and soft rot cause enormous losses in storage.

Tennessee: Black rot is very destructive, both in the field and storage house. It causes more loss than all the other diseases of sweet potatoes with the possible exception of the soft storage rot. The so-called charcoal rot is found along with black rot.

Root Rot caused by Ozonium omnivorum.

Occurs in Texas, New Mexico and Oklahoma. Loss probably 10%

Scurf caused by Monilochaetes infuscans.

Present wherever sweet potatoes are grown. Actual loss probably 1%, but the market value is reduced by the ugly appearance of the potato.

Storage Rots due to Several Fungi but Principally to Rhizopus nigricans and Sphaeronema fimbriatum.

Storage rots occur in winter and wherever sweet potatoes are stored in the United States. The annual loss varies from 10-50%.

Tomato Diseases.

Ohio: "Alternaria leaf spot has developed in rather an extreme manner on the early crop of tomatoes in the Marietta trucking district. In this district heretofore the leaf spot caused by Septoria has been frequent, but is almost absent at the present time. During the period of very hot weather, July 26-August 5, frequent reports of point rot of half grown or moderate sized fruits were received. The recent rains and cooler weather have resulted in more favorable conditions for the crop." -A. D. S.

South Carolina: Bacterial blight and Fusarium wilt of tomato very common and destructive. The Septoria leaf spot is also very prevalent and unusually destructive.

WINTER WHEAT

Bunt caused by Tilletia foetens, T. tritici.

Colorado: Abundant but not more so than last year. No regions free.

Missouri: Disease is locally reported. In some cases there is as much as 50% loss. St. Charles County seems to be comparatively free from bunt while much of the wheat in Jackson, Salina and Green Counties is affected.

New York: Further reports from New York show that in some infested wheat fields the amount of smut runs as high as 30%. Figures of definite percentage determinations are available from 100 fields. It is re-

ported that 45 fields are free from bunt and the remaining 55 are affected to the extent of 2%. The threshing of the wheat will doubtless reveal a still larger amount of bunt.

North Dakota: "Tilletia foetens used to be very prevalent in the state but is now very largely under control because of the universal use of seed treatment on the larger and older farms. There is always some smut in the various counties, because of newcomers, those short of help, or those who are shiftless and careless. Disease now mostly in the southwestern part of the state." -H. L. B.

Oregon: Reports from western Oregon state that there is considerable bunt in some fields the seed for which was treated. Barss thinks that perhaps this is due to infection from the soil last fall. The disease is present in comparatively small amounts in the Willamette Valley. It has been noted in abundance in eastern Oregon and in Jackson County.

South Dakota: The disease is practically under control. Probably 90% of the farmers treat seed with formalin. The western five-sixths of the state is practically free from the disease. It occurs in the eastern one-sixth and in occasional untreated fields.

Texas: Reports indicate bunt to be less than usual.

Loose Smut caused by Ustilago tritici.

Colorado: Not greatly abundant. Only a few cases have been noted.

Missouri: General over state but less than 1%. Occurs at Springfield, Edina, St. Charles, Marshall and Independence.

New York: New York has about fifty wheat fields that have been inspected and found to be free from loose smut. The work was carried on by the College of Agriculture, the New York State Food Supply Commission, and the Plant Disease Survey cooperating. The records are on file at Ithaca.

North Dakota: "Loose smut is appearently not showing as common in the heads this year as usual, though it has been observed in the wheat throughout the state. .001% to 1.5% is about the usual run as to intensity of seed infection. Could be controlled, but our farmers work on such a large scale they cannot use hot water method or seed plot method to advantage."

South Dakota: There is a little more of this disease than usual. None of the farmers treat their seed for this disease and it seems to be gaining. It occurs all over the state.

Texas: 2½% of crop injured.

Scab caused by Fusarium culmorum.

Missouri: None reported except at Columbia where it is common.

North Dakota: "Fusarium culmorum and other species of Fusarium are less abundant than last year. Last year it ran epidemic in the durum and marquis wheat, almost destroying these crops in some sections before the rust came. This year the disease showed up at seeding time, preventing sprouting of a percentage of seed and preventing proper stool formation thru'out the season, but on account of the dry harsh straw it did not reach the heads. The hot dry winds and lack of dew also prevented its spread from field to field." -H. L. B.

Oregon: Very little scab this season.

South Dakota: Comparatively little this year. Last year it destroyed one-third of the crop in eastern South Dakota and about one-fifth in western South Dakota. L. H. Pammel, on a recent field trip, found considerable scab in certain parts of South Dakota and western Minnesota. In the vicinity of Graceville, Minnesota, there was about 5%.

Leaf Rust caused by Puccinia triticina.

Missouri: Abundant at Springfield, Edina and Marshall.

North Dakota: Leaf Rust (Puccinia triticina) is not abundant this year. Not sufficiently abundant to interfere with P. graminis which started early on the Barberry bushes of Minnesota and spread evenly and rapidly over the state. On account of the dry weather and harsh growth of straw it produced little effect this year, but there was enough heavy early infection to destroy ordinary crops under ordinary weather conditions. North Dakota barberry bushes and hedges are being eradicated now.

Oregon: It is believed to be of economic importance when occurring on certain varieties of wheat.

South Dakota and West Minnesota: Considerable in places, especially on late wheat. The early wheat escaped.

Texas: Rusts practically absent in 1917 on all cereals, evidently because of dry winter and spring weather.

Yellow Stripe Rust caused by Puccinia glumarum.

Oregon: Very little damage has been noted as a result of the disease upon any of the cereals this year. This is doubtless due to the excessively dry season. It has been found in abundance upon certain of the wild grasses.

South Dakota: Disease observed by Dr. A. G. Johnson at Newell, S. D.

Black Chaff.

Dr. Smith furnishes the following statements respecting the bacterial disease of wheat described by him in the Journal of Agricultural Research, July 2, 1917.

"Including myself I have had 15 persons at work upon the problem this summer. Most of my own time has been given to it since the middle of May. We have this year found the new wheat disease in the following states: Texas, Oklahoma, Arkansas, Missouri, Kansas, Nebraska, Iowa, Wisconsin, Minnesota, North Dakota, South Dakota, Colorado, Montana, and California. The identification has depended not solely on the signs already described, but on these together with microscopic examinations which have shown the presence in the lesions of bacteria in great numbers, often unaccompanied by fungi, and on the fact that upon a great number of agar-poured plates made from interiors after surface sterilization we have always obtained the same organism, often in pure cultures. No doubt now remains as to the bacterial nature of this disease since we have not only isolated the same organism in the way described out of wheat from widely distant localities, but also from various parts of the plant -- diseased leaves, stems, glumes, and kernels, and with it have reproduced the disease both on spikelets and on young plants -- my last set of seedling inoculations (119 plants) gave 95 per cent of infections at the end of 8 days. Doubt remains, however, as to whether or not it is identical with the bacterial barley disease of Jones, Johnson and Reddy, for the clearing up of which we must await the appearance of their paper now in press. The most striking feature of this disease is the general prevalence of this organism on or in the wheat grains, thus making the disease admirably adapted for rapid dissemination. Not infrequently every shriveled kernel of a diseased head carries the bacteria either on its surface as a thin film, or in very great numbers in corroded cavities in the interior of the kernels. It is essential, therefore, not only to screen out all shriveled kernels from wheat designed for planting but also to devise some method of surface treatment for the remainder. The abundant oozing of the bacteria to the surface of diseased parts -- leaves, stems, rachis, glumes, awns,-- must also greatly favor transmission by birds and insects. For these reasons I can not believe that the disease has been in the country very long."

THE PLANT DISEASE BULLETIN

Issued By

The Plant Disease Survey

Number 3, September 15,

1917.

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

CONTENTS

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Virginia: Mr. J. A. McClintock,
Virginia Truck Experiment Station, Norfolk.

Wisconsin: Prof. R. E. Vaughan,
Agricultural Experiment Station, Madison.

Wyoming: Dr. J. F. Groves,
Agricultural Experiment Station, Laramie.

REPORTS

During the last week of August special crop disease report blanks were sent to collaborators asking for information on the diseases of cabbage, corn, tomato and buckwheat as they occurred September 1. Number 3 of the Plant Disease Bulletin contains the more important facts thus collected, together with notes on the prevalence of certain other plant diseases.

BEANS

M. F. Barrus during a recent trip to the Pacific Coast visited bean fields in the states of Michigan, Idaho, Colorado, Utah and California. The beans in the four latter states were found to be practically free from all diseases with the single exception of those in Idaho where a small amount of bacterial blight was encountered. In Michigan frost has recently done a great deal of damage. Blight is very common. Anthracnose is scattered but is abundant in some places. Mosaic is quite common in Michigan, there being some in almost every field, in a few instances 50% of the plants being diseased.

Anthracnose caused by Colletotrichum lindemuthianum.

Colorado: Disease about as prevalent as usual.

Indiana: Common throughout the state. Not particularly abundant last year. The seed used this spring was considerably affected. The wet weather early in the season favored development.

Maine: Disease common and destructive wherever beans have been planted this year. There is much more this season than last when it was worse than usual. Infection of stems and leaves was common and serious, and pod infection is almost universal. In many instances pods were destroyed before the seeds began to enlarge. The almost continuous rainy weather since planting time has greatly favored the disease.

Mississippi: A slight amount of this disease in most of the bean growing sections. Prevalent in about the same amounts as last year. Pod infection is the most common form, as the weather was not favorable until near harvest time. The wax pod varieties are most affected.

Missouri: Anthracnose very prevalent at Springfield.

Washington: Disease very rare in state of Washington. Has not been observed anywhere this year and all of the market products are perfectly free from anthracnose.

Bacterial Blight caused by Bacterium phaseoli.

Colorado: Quite abundant this season. First appeared at Fort Collins during July. Pod infection is most common.

Indiana: Blight quite common, there being considerable injury to stems, leaves and pods. There was considerable loss in the seedling stage in some fields.

Maine: No case is reported in Maine this season.

Mississippi: Disease not important.

Washington: No authentic specimens have been observed from the state.

Other Diseases.

Rust caused by Uromyces appendiculatus is reported as occurring in Colorado Indiana and Maine this season.

Mosaic is common in Indiana and one case is reported from Washington.

Rhizoctonia is the most important bean disease in Washington and stem rots, caused by Rhizoctonia and other fungi, are said to be abundant in Indiana.

CABBAGE

Club Root caused by Plasmodiophora brassicae.

Club root is common and in some places severe in the northeastern section of the United States. According to reports received the area within which the disease is of economic importance this season is bounded on the west by Michigan, Indiana, Kentucky and Tennessee and on the south by South Carolina.

Alabama (Hewitt): Club root is of rare occurrence. It has been reported in the hills in the northern section. High temperatures apparently limit seriousness of the disease.

Arkansas: Probably very little. It has been reported only twice in the last two years.

Colorado: Not reported this summer.

Delaware: Disease very common. It occurs in greatest abundance at New Castle, Newark and in the vicinity of Wilmington. First reported as occurring in the seed-bed, on April 15th at New Castle. It is estimated that 5% of the cabbage land is infested and on infested fields from 15 to 60% of the plants are diseased. Disease is particularly common on heavy land but this may be due to the fact that cabbage is most generally grown on such soils near larger cities.

Idaho: Disease not reported this season.

Indiana: Club root not common. One report from Lake County.

Kansas: No report of the disease.

Louisiana: Not known to occur in the state.

Maine: No specimens received this season.

Michigan: Found only in garden patches. Only one complaint received from cabbage fields during the past six years.

Mississippi: No record of the occurrence of club root in the state.

New Hampshire: Club root generally distributed but nowhere severe. First reported August 1, from Strafford county. Only a small amount of the disease in infested fields.

New Jersey: Frequently reported. Most abundant in the northern part of the state. First reported in June from Bayonne. Most prevalent on heavy soil.

New Mexico: Disease not reported.

New York: Club root general wherever cabbage is grown. Specimens have been received at the station this season from Livingston, Orange, Wayne, Courtland, Franklin and Monroe counties. First report was July 12, from Williamson. About 2% of the cabbage fields have more or less club root and the amounts vary from a trace to 100% this season. "The disease is usually most prevalent in undrained soil or in low places where the debris has been washed down. The occurrence of the disease is usually simultaneous with the occurrence of hot summer weather." -C. C.

North Carolina: Very prevalent and destructive in the state. All cabbages and collards diseased in eastern part of state.

Ohio: Club root is found in all cabbage growing districts and occurs in practically every county of the state. This season it was first reported May 25, Stark county. Black soils seem to be worse than others, also garden soils that have been heavily manured.

Tennessee: Club root not found during season.

Texas: No report this year.

Vermont: Common in market gardens and in many private gardens. It occurs in practically all counties of the state. First reported this season August 15 to 20 from Burlington. At least 10% of the cabbage land in Vermont is infested. Acid soils with an abundance of humus seem to be most favorable for harboring the organism.

Virginia: Disease not so common as formally. No reports received this year.

Washington: Not uncommon in the two cabbage sections. Definite reports are at hand from King and Pierce counties. The amount of disease is small in the fields observed, only 2 to 3% of the plants being diseased but in other places it is understood that there is considerably more.

West Virginia: Disease fairly common but not usually causing serious losses. First appearance this season in August at Elkins. From 1 to 2% of the plants in the infested fields examined were diseased.

Wisconsin: Disease in comparatively small amounts but fairly widespread and increasing. First appeared this season in July at Racine. The amount of infested cabbage land is small and on this land the percentage of the disease is not large. No relation has been observed between soil types and amount of disease. Practically all Wisconsin cabbage is raised on heavy loam soils containing more or less humus.

Cabbage Yellows caused by *Fusarium conglutinans*.

Yellows is common this year in the region from New York to the Carolinas, thence westward to the Mississippi River, and southwestward in the states of Arkansas, Texas and New Mexico. The area of infested land is said to be increasing in extent in most states.

Alabama: Very little of this disease, but scattering reports have been received from Mobile, Lee and Cullman counties.

Arkansas (Hewitt): Yellows is reported near Fort Smyth and near Little Rock The trucking region in the southwestern corner of the state is probably too recently established to be badly infested. Last year a few resistant Wisconsin seed were planted about Little Rock but the varieties were late and unpopular.

Delaware: Disease common and increasing. First reported this year May 10, from Newark. It is estimated that 5 to 10% of the crop has been injured.

Indiana: Disease is common and increasing from year to year. Wisconsin seed in small amounts has been distributed. Most of the cabbage grown is of Kraut varieties.

Kansas: Disease not especially severe in the state. First reported July 10, from Bethel.

Louisiana: Yellows only known in two localities. Reported in May from Roseland. The amount of injury is slight.

Michigan: Three reports this year which are the first ever brought to the attention of the pathologists at the station. First reported August 15th from Monroe county.

Mississippi: Yellows is present in all cabbage sections of the state. First appeared May 1st at Crystal Springs. The amount of infested land is increasing from year to year. From 10 to 20% of the crop has been injured to date. No resistant seed is being planted.

New Jersey: Disease present and increasing from year to year. 5% of the crop has been injured. Samples of the Wisconsin resistant variety have been received by 100 growers.

New Mexico: More common than last year. First reported in July and increasing from one year to the next. 10 to 25% injured. No resistant varieties are being grown.

New York: Disease fairly common. First reported August 8 from Cortland. It appears to be increasing in the state. No data as to the percentage of injury but there was from 1 to 10% loss in the fields that have been reported.

North Carolina: Disease very widespread and the cause of considerable loss. No resistant seed is used as the Wisconsin strain is not resistant in North Carolina.

Ohio: Less disease than usual but the amount of infested land is increasing from year to year. Some resistant cabbage is being grown around Clyde.

Tennessee: Yellows reported from all parts of the state. First report July 14 from Springfield. About 10% injury to the crop this year.

Texas: Disease very prevalent and apparently on the increase.

West Virginia: Disease prevalent in about the same amounts as usual. First report August 1. It is in nearly every county as far as can be determined. Frequently as high as 25% of the crop is injured.

Wisconsin: Disease general on infested land. First reported in June from Racine. The area of infestation seems to be increasing slightly from year to year. 5% loss in counties where the disease is severe and where cabbages are grown extensively. The loss for the state as a whole is small. Nearly 300 pounds of resistant seed was used this year largely on infested fields of Racine, Kenosha and Brown counties.

Black Rot caused by Bacterium campestre.

Alabama: Disease very prevalent; widely scattered throughout state.

Arkansas (Hewitt): "Disease very common. Not a large percentage of loss so far, probably because cabbage interests are small and continuous cropping has not shown its effects. Seed treatment is not practiced." J. L. H.

Colorado: Black rot is quite abundant. First reported August 4. Losses are considerable but not accurately estimated as yet. Seed treatment practiced but little.

Delaware: Disease very common in all cabbage sections. First reported May 15. Loss estimated at 5%. Seed treatment is not practiced.

Indiana: Disease not especially abundant this year.

Louisiana: Black rot is not known to occur in the state.

Mississippi: Disease common and occurs practically everywhere cabbages are grown. Losses, however, are not extensive. First appearance in March. Seed treatment not practiced.

New Jersey: Scattered reports of disease throughout the state. Seed treatment is practiced very little.

New Mexico: Disease more common this year than usual. First appeared in July. Loss about 5%. Seed treatment not practiced.

New York: Black rot is known to occur in at least six counties this season. First appearance July 3. Only a few growers treat their seed.

Ohio: Disease less prevalent than usual so that losses are of little importance. Seed treatment is generally practiced in the kraut district but not elsewhere.

Tennessee: Common in all sections, occurring in practically every county that has been studied. First appeared in May. Loss 10%. No treatment of seed reported.

Virginia: Disease common. First appeared July 15. No seed is treated in the large cabbage section of Wythe and Smyth Counties.

Wisconsin: Black rot is general and occurs in all counties of the state. First appeared in June. Losses small to date, but may become serious if the month of September is wet. Scattered growers treat their seed as this practice has been recommended through the press and at Extension meetings.

Black Leg caused by Phoma oleracea.

Alabama: Disease never noticed in this state.

Arkansas: Present last year, not reported this year.

Delaware: Disease of sporadic occurrence and present in all counties. First appeared May 1. Loss difficult to estimate but in some cases there was 50% or more. Seed treatment is very effective.

Indiana: Black leg not abundant but observed occasionally.

Louisiana: No disease observed this year. Small amounts have been present in other years.

New Jersey: Disease occurs in scattered districts, particularly in Cape May County.

New York: One report of the disease received from Suffolk County Aug. 1.

Ohio: More black leg this year than last. It occurs in all cabbage-growing counties. First appeared May 1. 2-3% loss in the kraut district. Seed treatment not effective. Seed-bed treatment is advised.

Virginia: Disease slightly prevalent. First appeared July 1. 10 to 15% loss was observed in a field of cabbages that were just beginning to head. In Smith county the disease was found only in fields which had been planted from one lot of seed from the same source. Other fields were free from it.

West Virginia: Black leg reported but once in August.

Wisconsin: Black leg generally prevalent. First appeared this year in June. Losses in some fields are heavy. Seed treatment is effective if the seed is planted in a clean seed-bed and plants set in clean fields.

Root Knot caused by Heterodera radicicola.

Alabama: Disease present everywhere in the state especially in home gardens.

Arkansas (Hewitt): Root knot widespread in sandy regions. Nematodes are a pest of all garden crops.

Delaware: Disease common in Sussex county.

Louisiana: Not especially common this year although no survey has been made.

Tennessee: None reported this year. Last year there was some damage from this trouble.

Texas: Disease prevalent with approximately 1% loss.

Other Diseases.

Alabama: Black mold caused by Alternaria brassicae is reported especially on collards. Rhizoctonia and Sclerotium Rolfsii are very common. Last winter cabbage fields of Mobile county were badly attacked by cabbage "drop" due to Sclerotinia libertiana. Some of the fields were so badly affected that 50% of the crop was lost. The variety Successive appeared to be most susceptible. Infection apparently occurs in the seed bed from the soil. This appears to be the most important cabbage trouble in Alabama.

California: Ring spot of cauliflower caused by Mycosphaerella brassicicola is getting very abundant on the winter crop in some sections but it is not prominent this season.

Delaware: Bacterial soft rots are very common there being from 3 to 5% loss.

Louisiana: Rhizoctonia is very common. It not only causes a damping off disease but seems to be the cause of black shank disease of cauliflower in the state.

Virginia: Damping off causes some trouble every year. Cabbage seed is sown in hills in the field. Because of this a high percentage of plants are lost by damping off, but enough survive to provide an even stand.

CORN

Smut caused by *Ustilago zeae*.

In addition to inquiries relating to the occurrence and prevalence of smut the three following questions were asked of collaborators, September 1:

(1) Do you consider the disease to be increasing in the corn regions of your state?
(2) Does continued cropping to corn seem to increase the amount of disease.
(3) Do your observations indicate that the disease is more prevalent on high land than on low?

The answers to these, given below in tabulated form in the last three columns seem to show that the disease is increasing in the corn-growing areas; that continued cropping, especially if accompanied with heavy manuring, increases the amount of smut; and that the elevation of the land is not an influencing factor.

In general, the amount of corn smut seems to be somewhat greater this year than usual.

Table 1.- Summary of Reports on the Occurrence of Corn Smut, Sept. 1, 1917.

State	Prevalence as compared with average.	Date of first appearance.	Disease increasing or not in corn regions.	Effect of continued cropping.	Influence of altitude.
Ala.	Less	June	Seasonal variation only.	Increases.	Low land favorable.
Ark. (Hewitt)	Much greater	Early	Increasing.	Increase especially noted in Ozark Co.	--------
Ark. (Elliott)	Slightly more	August	Prob. Increasing.	Increases.	High land favorable.
Del.	About same	July 15	About same	Continued crop. plus heavy manuring increases	--------

State.	Prevalence as compared with average.	Date of first appearance.	Disease increasing or not in corn regions.	Effect of continued cropping.	Influence of altitude.
Colo.	Same, abund.	Early Aug.	Increasing.	Probably increases.	———
Fla.	Considerably more.	July 5	Increasing, rarely noted until recently.	———	———
Ind.	About same.	———	No data.	Increases.	Probably does not influence.
Kan.	More.	July 1	Increasing when rotation is not practiced.	Decidedly increases.	No influence.
La.	More (very abundant).	Early July	Apparently increasing.	No evidence.	No influence noted.
Maine.	About same.	———	———	———	———
Mich.	Less.	———	Not increasing.	Increases.	———
Miss.	About same.	July 1	Not increasing.	Increases (on very fert. soils).	No influence noted.
N. H.	About same.	Aug. 17.	———	———	———
N. Y.	About same.	July 20.	———	Probably increases.	———
N. C.	About same.	June.	Not increasing.	Increases.	No influence.
Ohio.	Slightly more.	———	Not increasing.	Not unless associated with manuring.	No influence.
Penn.	None.	———	———	———	———
Tenn.	About same.	July 1	Not increasing.	Increases.	No influence.
Texas.	Very abundant.	———	Increasing.	Increases.	———
Vermont.	Less (rare).	Aug. 15.	Not increasing.	Does not increase.	No influence.
Va.	About same.	———	Not increasing.	———	———
W. Va.	About same (severe).	July.	Increasing.	Increases.	No influence noted.
Wisc.	About same.	July.	Not increasing (advent of silo has reduced.)	Wisc. farmers rotate.	———

Leaf Stripe Disease caused by Helminthosporium inconspicuum or Helminthosporium turcicum.

Alabama: Probably widely scattered but doing little or no damage. Only leaves here and there in fields are affected. This is not a serious disease in the state as yet.

Arkansas: Disease common on both sweet and field corn and is undoubtedly a large factor in killing some of the leaves.

Louisiana: Disease is very common on the lower leaves of corn but it is difficult to say how much of a loss may be due to fungi, dry weather, soil conditions etc.

Maine: The first specimen of Helminthosporium on corn leaves was received in Maine this year from York county.

New York: Leaf stripe reported from Orange, Suffolk and Tompkins counties, but in no case was it doing much damage.

North Carolina: Disease unimportant. Has been collected at Raleigh.

Pennsylvania: Definite reports have been received from one of the northern counties in the state.

Tennessee: A disease very much like this is present on corn around Knoxville. The blades become striped and die.

West Virginia: Disease present but doing no damage.

Rust caused by Puccinia sorghi.

Collaborators in the following states list Puccinia sorghi as being of economic importance: Alabama, Arkansas, Indiana, Louisiana, Michigan and Ohio. It is regarded as being of little or no economic importance in the states of Delaware, Colorado, Kansas, Maine, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Tennessee, Texas, Vermont, Virginia, West Virginia and Wisconsin. In some states the fungus is reported as killing all the lower leaves but in most places it appears so late in the season that comparatively little damage results. Fodder corn and sweet corn are most injured

Physoderma Disease caused by Physoderma Zeae-maydis.

Since the issue of the last Plant Disease Bulletin, Physoderma disease has been reported from five other counties in the state of Tennessee as follows: Madison, Franklin, Rutherford, Monroe, and Knox. The accompanying map showing the present known distribution of Physoderma on corn together with the areas in which it is known to be doing some damage has been kindly fur-

nished by Dr. W. H. Tisdale of the Office of Cereal Investigations, who is working with this disease in the south.

The Plant Disease Survey has recently sent into the field a force of twelve scouts who will make a careful survey of corn fields in the southern states where Physoderma is known to occur or where there is likelihood of its presence. This is a part of an effort to obtain authentic information regarding the distribution, economic importance, influencing factors, etc., in order that suitable control measures may be adopted.

Other Diseases.

Arkansas: "Ear molds caused by Fusarium are serious. They constitute the limiting factor in the production of some varieties. The affectation often follows ear worm injury but may be quite serious independently." J. L. H.

Florida: "Diplodia zeae was found rather abundantly on dead stalks of corn from the 1916 crop in the vicinity of Gainesville. It has not been noted so far in connection with ear rots." H. E. S.

Louisiana: "Fusarium and Diplodia rots occur to some extent but injury is usually not large. A stem rot of uncertain cause sometimes does considerable damage but it has not been reported this year. Corn rust probably does more damage than any other disease in Louisiana." C. W. E.

Tennessee: "A bacterial root rot on field corn has done much damage in sections of middle Tennessee and a blade blight of young corn was reported from one county early in the season."- S. H. E.

COTTON

A report received from the important cotton-growing state of Mississippi shows that anthracnose is present in all sections of the state but most abun-

dant in the low lands. Very few growers make any effort to control this disease.

Wilt is present in some fields in large amounts, in some cases 50% damage is reported. The area of infested cotton land is increasing.

Root knot is causing a good deal of loss.

Potash hunger is not at all serious. When it does occur it is found in very sandy regions in the southern parts of the the state.

Angular leaf spot is very common and the cause of a good deal of boll rot and seedling injury.

FLAX

North Dakota: Wilt caused by Fusarium lini is about as destructive as usual where non-resistant seed was used on old land. This varies according to the condition of the land and seed. First appeared this season May 1 to 10 at Fargo and other points. Formaldehyde treatment is effective on plump bright seed not internally infected. Treatment is not effective if the soil is infested. The pure bred strains of resistant flax are entirely resistant under normal weather conditions.

Rust caused by Melampsora lini is less common than usual, there being only a few scattering pustules noted. This disease causes great damage in case of plants grown for fibre, and is also very destructive on plants grown for seed in case the weather conditions are favorable to the disease. Resistant varieties are recommended.

Canker is rather more prevalent than usual this season. Frequently the disease is more common on virgin soil than on old fields. It usually develops as soon as the flax begins to appear.

OATS

Oat Smut caused by Ustilago avenae and U. levis.

Reports on oat smut have been received from three more states where the disease occurred this season in about the same amounts as usual.

Kansas: About 8% loss in untreated fields and 1% or less in fields where the seed was treated. It is estimated that about 10% of the seed oats were treated this spring. Nine counties are listed as being much in need of seed treatment demonstration work.

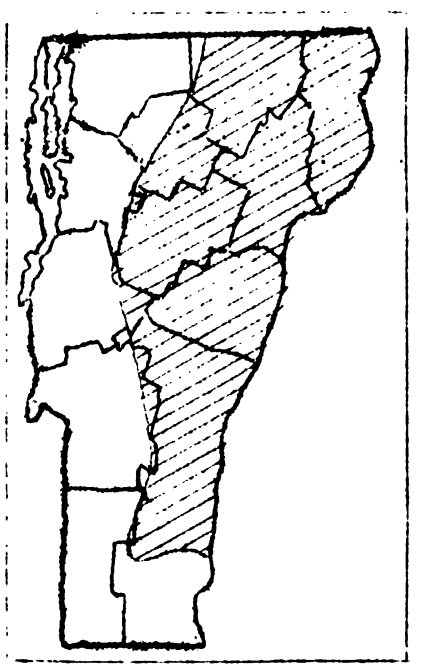
Mississippi: From 0 to 10% loss in fields planted with untreated seed. Every county in the state is in need of extension work along the lines of seed treatment.

Washington: Oat smut in this state appears to be due almost entirely to Ustilago levis. Little or none of the species U. avenae occurs. In untreated fields the amount of smut varies from 0 to 25 or 30%, while in treated fields there is only a fraction of 1%.

POTATOES

Late Blight caused by Phytophthora infestans.

Vermont: Collaborator B. F. Lutman returning from a recent field trip through the potato sections of Vermont has furnished the following report on late blight: "Blight has struck the better potato growing regions of the state with the exception of fields at Rutland and Bristol. The disease has occurred throughout the state in scattered fields since the first week in July, but since the middle of August it has become very destructive in the eastern portion of the state and at the present time (Sept. 7) all the foliage is dead on three-fourths of the plants in the area shown on the map. The fields that were thoroughly sprayed have escaped to a considerable extent, but all fields show it on every plant. The tubers are rotting in some parts of the affected portions of the state and the growers are getting them out as rapidly as possible, as the wet weather has continued, and the ground is soaked. Few fields on the west side of Vermont are affected to any extent, although some plants show a little blight in almost every town." B. F. L.



Washington: A small amount of blight has appeared in the Coast regions but no serious outbreaks are reported. There is less of this disease at present than at the same time last year, the season being too dry for its development. In eastern Washington there has been no rain since the first of June although the Coast counties have had a little. The chances of a serious outbreak this late in the season are small.

Potash Hunger.

Maine: This disease is prevalent but in less amounts than last year. No cases have been seen that were as bad as those in 1917.

Washington: Last year this was one of the most common troubles on light soils judging from specimens sent in. This season however, no reports regarding disease on this year's crop have been received.

Rhizoctonia Stem Rot caused by Rhizoctonia solani.

Indiana: Disease abundant and severe this year, being present in some places to the extent of 50% of the plants. Much of the seed used was badly covered with sclerotia. The stem rot form of the disease is most common at the present time.

Kansas: Rhizoctonia has been very apparent this year in most of the fields, running anywhere from 1 to 15 or 20% of the crop. This disease has been responsible for numerous missing hills in many fields, the plants being severely injured when they were five or six inches tall. In most cases, it was found that the seed had not been treated, having been shipped in from the north.

Maine: Rhizoctonia injury not observed in as great quantities as usual.

Washington: This is the most serious disease of potatoes in the state. It is more severe this year than last on account of dry weather. Some fields are very seriously damaged.

Other Diseases.

Mosaic is rather common in Maine, but only a few severe cases have been noted this season. Red Bliss variety is affected worst, Green Mountain next, and Cobblers are almost entirely free.

The potato disease that is next in importance to Rhizoctonia in Kansas is black leg. The injury from this disease ran as high as 25% in some fields. There were also a number of cases of a combination of black leg and Rhizoctonia injury. This year will probably be sufficient to demonstrate to the farmers that they will have to treat seed hereafter before it is planted.

Black leg is quite common and causing considerable damage in Indiana. In some cases a 20% loss is reported. Early blight caused a great deal of damage to the potato crop in Mississippi early this season.

Tip Burn.

"Tip burn was perhaps the most common injury of all in Kansas this season. By the middle of July most of the fields were beginning to turn very brown and the vines in many cases were already dead. July was extremely warm and little rainfall occurred." - L. E. M.

"The regions in Vermont that are not affected by late blight are struck by tip burn but only a little more seriously than normal for this section. On sandy soil the plants have suffered worst and even the late varieties are in some cases all dead. Between late blight and tip burn the crop is cut down to almost a normal one. The increased acreage was estimated by the county agents at a recent meeting at about 50% for all the state, but these two diseases will reduce the yield between 25 and 50%, depending upon the amount of rot that will follow the blight."- B. F. L.

RYE

Ergot appeared in epidemic proportions in some places in Indiana. In one field there was as much as 30%.

Anthracnose occasionally found. In one field there was nearly 100% loss.

SWEET POTATO.

Wilt caused by Fusarium batatatis.

Kansas: Disease occurs in all sweet potato sections of the state. All varieties are affected. Losses range from 17% to 30% or 40%. Disease is apparently on the increase with the result that the area devoted to sweet potatoes is decreasing.

Mississippi: Disease first observed this year July 18. Losses are large in places. Nancy Hale one of most susceptible varieties.

White Rust caused by Albugo Ipomoeae panduranea.

Kansas: Disease appeared in August. In some years it is very prevalent.

Mississippi: Very little white rust this year.

Other Diseases.

In Mississippi the disease caused by Sphaeronema fimbriatum is the most destructive of all sweet potato troubles, doing damage both in field and in storage.

TOMATO

Reports on tomato diseases have been received from the following states: Arkansas, California, Colorado, Delaware, Indiana, Kansas, Michigan, Mississippi, New Jersey, New Mexico, New York, Ohio, Oregon, Pennsylvania, Tennessee, Texas, Virginia, Washington and West Virginia. The absence of a note from any of these states indicates that the particular disease is of little or no importance.

Wilt caused by Fusarium lycopersici.

Fusarium wilt has done an unusual amount of damage in some of the Southern States. Reports of extremely serious losses come from California, Texas, Mississippi and New Mexico. There follows detailed reports from individual states.

California: A wilt disease, apparently Fusarium, is unusually abundant this year and threatens to cause serious losses. This particular trouble does not appear regularly from year to year but is of sporadic occurrence. Seems to occur on new soil in same amount as old soil.

Delaware: Disease quite common in the central part of the state. First appeared July 1 and is now causing losses ranging from 5 to 10%. It seems that the amount of wilt is increasing from year to year. Poorly drained soils are very subject to the disease. Resistant varieties and rotation of crops is advised.

Indiana: Common in some sections but not as prevalent as usual. In general the amount of disease seems to be increasing from one year to the next. Rotation of crops is recommended.

Mississippi: Fusarium wilt is very common all over the state. It was first reported this year May 20. Losses in commercial fields do not run over 5% but in home gardens the crop is reduced 25% on an average. The amount of infested soil seems to be increasing rapidly from year to year. No relation is noted between soil type and amount of disease. Rotation is quite successfully employed.

New Jersey: Reported this year in two sections in June. Amount of disease is annually increasing. Rotation is recommended.

New Mexico: The past year has been the worst ever experienced as far as Fusarium wilt is concerned. There is possibly some doubt as to whether or not this particular Fusarium wilt in New Mexico is caused by Fusarium lycopersici. It was first noticed in July and the losses range from 5 to 50%. In some places fields were entirely destroyed. The first report of this disease was in 1904. Since that time it has been increasing from year to year until now it is the worst disease in the state. The disease is common on sandy as well as adobe soils. Selection of seed for resistant varieties in badly infested fields is being advised.

Ohio: Disease is more prevalent than usual this season. First reported June 15. The losses amount to nearly 25% in many cases. The amount of damage is increasing from one year to the next. Rotation is being practiced and resistant varieties are being used with good success.

Pennsylvania: Disease reported several times. First appeared in July.

Tennessee: The disease is common in all tomato sections. It first appeared this year June 1. Losses range from 10 to 75% and the disease is increasing. Crop rotation and the use of resistant varieties are being practiced with marked success.

Texas: Disease very prevalent.

Virginia: Fusarium wilt is widespread. The losses may amount to 25% this season. Apparently the disease is on the increase. Some fields have been abandoned for tomato culture. Rotation is being employed and it is expected that some resistant strains will be introduced.

West Virginia: About the same amount of disease as usual. First reported in July. Losses quite heavy, especially in the Ohio Valley. The disease is worse on river bottom land and in soil containing a considerable amount of fresh humus. Rotation practiced with uncertain succes

Bacterial Blight caused by Bacillus solanacearum.

This disease appears to be attracting only a little attention this season as it has been reported from only two states, Tennessee and West Virginia. In the former state it was first noticed July 1 at about the time when the fruit was setting. In some fields there was a loss of 60%. The Stone variety appeared most susceptible.

In West Virginia the disease is quite general but not severe at any place so that the losses are comparatively small. Usually appears in this state about two or three weeks after blossoming time.

Septoria Blight caused by Septoria lycopersici.

Septoria blight has been prevalent this year in most tomato-growing sections of the United States. It is estimated that the losses from this disease are almost as great as those resulting from Fusarium wilt. The following summary of reports from collaborators has been prepared.

Table 2.- Summary of reports on the occurrence, importance, and control of Septoria blight caused by Septoria lycopersici.

State	Prevalence	Earliest Report	Importance	Effectiveness of Bordeaux
Ark.	Very prevalent.	July	5-10% injury.	----------
Calif.	Not serious.	-----	----------	----------
Colo.	Prevalent.	-----	One of most important tomato diseases.	Effective if applied early.
Del.	Gen. prevalent.	June 20	Very important.	----------
Ind.	Abundant, espec. in south.	-----	Serious	----------
Kansas	Practically absent this year.	-----	----------	----------

State	Prevalence	Earliest Report	Importance	Effectiveness of Bordeaux
Mich.	Not prevalent.	-----	---------	----------
Minn.	Abundant.	-----	---------	----------
Miss.	Gen. prevalent.	May	Slight importance.	Usually effective.
N. J.	Abundant.	July	Most important foliage disease.	----------
N. Y.	Prevalent	June	---------	----------
Ohio	Much less than usual.	June 15	Most important foliage disease.	Effective.
Ore.	Never been reported.	-----	---------	----------
Penn.	Fairly prevalent.	-----	---------	----------
Tenn.	Gen. prevalent.	In seed-bed.	Next in importance to Fusarium wilt.	Effective.
Texas.	Not prevalent.	-----	---------	----------
Va.	Very prevalent. Almost universal.	July 15	Always important. Often reduces yield 50%.	Not effective.
W. Va.	Same as usual.	June	Very important.	Not entirely. Reduces injury.

Alternaria Blight caused by Alternaria solani.

California: Some loss early in season, killing the terminal growth. Occurs during moist weather which comes in spring or late fall in California.

Delaware: Quite general this year. Appeared July 1. The amount of injury done however, is not important. It is thought that drought increased the amount of disease.

Indiana: Common this year but not observed to be serious in any way.

Michigan: The disease is present but the amount of damage is small.

Mississippi: The disease is present in only small amounts this year. It was first noticed March 22. Injury to the foliage is only slight and

no injury has been noted on the fruit. Spraying seems to hold the di ease in check. It is most destructive during wet springs such as was experienced in 1913.

New York: Disease is present wherever tomatoes are grown. In some places all foliage is killed. No authentic reports of fruit injury are on record. It is believed that when spraying is begun in time it will hold the disease in check. More abundant in seasons when the rainfal has been heavy.

Ohio: Disease generally prevalent in the southern part of the state but not serious. First reported July 10. It is estimated that 50% of the foliage is damaged but fruit injury is very small. Spraying tends to hold the disease in check. Its appearance is coincident with hot, dry weather and little rainfall following colder weather with heavy rainfall.

Tennessee: Disease is common this year and appeared June 1. About 50% of the foliage is more or less affected and slight injury to the fruit associated with blossom end rot is reported. Spraying is somewhat effective. More injury is noted in wet than dry weather.

West Virginia: About the same amount as usual but the extent of the injury to the foliage is very slight as compared with that due to Septoria Only a small percentage of the fruit is spotted.

Phoma Rot and Blight caused by Phoma destructiva.

Delaware: Disease common on fruit. First reported July 30 from Newark. Usually appears at time of maturing. Some varieties appear very susceptible and others quite resistant in Delaware. It is probable that drought is favorable to the disease.

Tennessee: Phoma was found in small amounts at Knoxville in June. Some was sent in also from Cleveland.

Blossom End Rot (Physiological).

California: Not as abundant as usual this year.

Colorado: Not abundant. Drought conditions favor development.

Delaware: This trouble is common on susceptible varieties such as Greater Baltimore. Stone and Bonny Best are less affected. Drought conditions have been somewhat favorable for the disease.

Indiana: Not at all common in some sections. Dry weather or irregularity in moisture supply favors it.

Kansas: Practically none this year.

Michigan: Common but not reported as serious probably because the crop has largely failed to ripen.

Mississippi: This disease is common all over the state in every community. Probably there will be about 40% loss. The injury took place during the dry weather in June and stopped when the rain came later. Variety Stone was especially susceptible and Early Detroit, Mascot and Globe were more or less resistant.

New York: Disease fairly prevalent. Reported in most cases at a time when the weather had been wet.

Ohio: Blossom end rot unusually prevalent this season. The third and fourth sets were affected.

Oregon: Abundant this year. Entire season has been dry, somewhat hot and often windy. Little or no rain in the state since June.

Tennessee: Common in all sections. Appears always in dry weather and especially on clay soils. All varieties seem to be affected.

Texas: Disease occurs in unusual amounts this year.

Virginia: Disease common. The early drought caused considerable loss but rainfall checked it.

Washington: "Very little this year. Temperature this season has been moderate and there has been almost no rain. Two years ago when the disease was very prevalent with us the season was dry and the month of August was extremely hot."- F. D. H.

West Virginia: Blossom end rot quite prevalent. The season has shown nothing abnormal except cold wet weather until June.

Other Diseases.

Mosaic is abundant in Delaware. It is planned to select seed from the non-infected varieties. In California it has been causing some trouble, and in Indiana and Kansas it occurs to some extent but is not serious.

Cladosporium fulvum caused a very important greenhouse disease in Michigan. 20% loss was experienced in one greenhouse. This trouble was also reported as being fairly common in some of the greenhouses in New York.

Early blight or Western blight is probably the most serious disease of tomatoes in Oregon. Great losses have occurred this year in some patches. There are no means of prevention or control. It is probably one of the chief limiting factors to tomato growing in the state.

"Late blight due to Phytophthora infestans quite prevalent in West Virginia, causing serious losses in higher elevations. Seems to have been especially bad in the central and southeastern portion of the state."- N. J. G.

"A conspicuous trouble which seemed very prevalent in many places in Kansas was the so-called blossom drop. Is more or less conspicuous every year in state. Cause or factors entering into the trouble have not been solved. Plants are very thrifty, blossom profusely but the blossoms drop. Indications do not tend toward any factor in general which can be responsible for the disease."- L. E. M.

THE PLANT DISEASE BULLETIN

Issued By

The Plant Disease Survey

Number 4, October 1,

1917.

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

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REPORTS

On the preceding page there is given a list of collaborators who are making reports that appear in the Plant Disease Bulletin. Unless otherwise indicated these collaborators are responsible for the reports from their respective states. Where there are two or more in a state the one whose name appears first is the authority for the report. In case one of the other collaborators furnishes the information his name will appear in parenthesis after the name of the state.

The present number of the Plant Disease Bulletin deals principally with diseases of fruit as they were reported as occurring on September 15. The statistics on frost injury were obtained from the United States Weather Bureau, Division of Agricultural Meteorology, which Office in turn secured the information from their cooperative observers.

FROST INJURY

The frost that occurred September 9-12 was exceptionally early and severe over the interior of New England and New York, about half of Pennsylvania, northwestern Ohio, northern Indiana and Illinois, a small part of Iowa, and most of Michigan, Wisconsin, Minnesota and North Dakota. Many highlands and locations near lakes however, escaped without harm.

Corn was damaged materially in the northern and northeastern sections of the country. North Dakota reports 30% injury; Wisconsin 30-35%; Michigan 10% on low land; Indiana less than 50% on low land in extreme north; New York 30% in the eastern portion, and in the states of Ohio, Pennsylvania, West Virginia and Iowa the crop suffered more or less injury.

Potatoes and truck crops were injured throughout the Lake region and in the northeast. The bean crop in eastern New York was damaged to the extent of 20%. In Michigan the estimate is 10%, while in Wisconsin late beans were damaged 20-30%.

Cranberries in Wisconsin were injured to the extent of 20-30%. Great damage was done to the crop in New England and in New Jersey 25-50% of the cranberries were destroyed.

The accompanying map prepared from the reports in the National Weather and Crop Bulletins for the weeks ending Sept. 11 and 18, shows the approximate areas of severe and slight frost injury. The heavily shaded portions represent areas where there were killing frosts quite generally distributed except near bodies of water and in protected localities. The lighter shaded area indicates light frosts, local in occurrence and only slightly injuring vegetation.

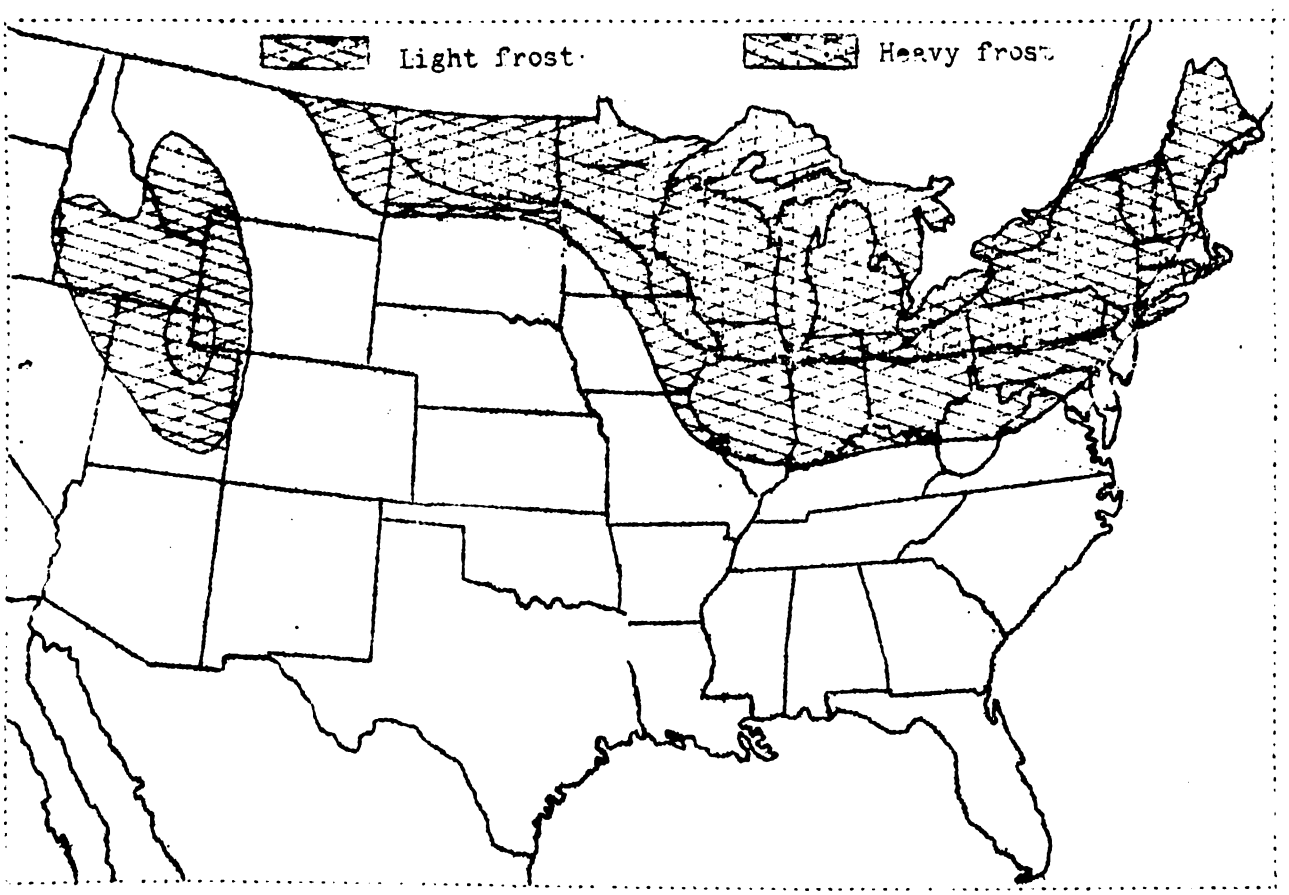

Fig. 3- Map showing area of occurrence of frost September 11-18, 1917.

DISEASES

APPLES

Scab caused by *Venturia inaequalis*.

The unusually large amount of scab in 1916 afforded an abundance of infested leaves for carrying the causal fungus through the winter. The rainy months of May and June 1917 were favorable for primary infection of the young leaves in most of the northern apple-producing states, with the result that the prospects for an epiphytotic were good. Considerable infection of the young fruit occurred and in some cases pedicel infection is reported as severe. The weather of the latter part of the summer was not especially favorable to the disease so that only a small amount of scab developed on the more mature fruit. The disease is reported as being worst this year in the states of New Jersey, New York, Michigan, Ohio, Virginia, Colorado, Arkansas and Tennessee.

Alabama: Disease never bad but prevalent in about the same amount as usual.

Arkansas: Leaf infection severe this year and early fruit infection occurred in large amounts in some orchards. Only a slight amount of disease developed later in the season. Spraying is effective when the application is made at the proper time. Scab is never severe in well kept orchards but is very severe in badly kept ones.

Mr. J. W, Roberts, Office of Fruit Disease Investigations, Bureau of Plant Industry, reports that the amount of disease in Arkansas this season is very slight as compared with the three preceding years. Dusting is employed to slight extent but scab not severe enough to give it a test. No reports that scab is serious.

Colorado: Disease not serious. It is so unimportant that Colorado fruit growers do not take it into consideration when spraying.

Connecticut: Apparently less than usual. Three applications of lime-sulfur have given good results. Dusting is being tried somewhat experimentally but has not been taken up generally.

Michigan: Prevalent in about the same amount as last year. In the College orchards spraying has been remarkably effective. Dusting is being taken up in an experimental way. Reports indicate that results are not as satisfactory as could be wished this year.

Mr. Leslie Pierce, of the Office of Fruit Disease Investigations, Bureau of Plant Industry, reports that in Berrien, Oceana and Grand Traverse Counties the disease is slightly more prevalent than usual. Leaf infection was severe and took place about May 28, five days after full bloom. Infection of the pedicels was slight only and occurred June 15, or 19 days after bloom. Early fruit infection was severe and occurred at the same time as that of the pedicels. There was a moderate amount of late infection on the older fruit August 20, at a time when the apples were half grown. In these counties from 40-95% control was obtained depending on time of application and thoroughness of work. Dusting not being practiced to any extent.

Minnesota (Stakman): Considerably less than last year. A slight to moderate amount of leaf and pedicel infection occurred about June 24, just after blooming. Only slight infection of the young fruit and no infection of the more mature fruit. Commercial lime sulfur 1-40 or 1-45 is most commonly used and is effective. Scarcely any dusting being done.

Mississippi: Scab is never serious in state.

New Jersey: More scab than usual. Leaf infection severe. Excellent results from spraying.

New York: About the same as last year, but reports of greater prevalence come from Allegany, Montgomery, Onondaga, Ontario, Tioga, Ulster and Wayne Counties. Primary leaf infection quite severe. First occurred in the state about May 30. In general the results from spraying have been very good. Dusting is reported as being carried on in at least five counties with very good results.

Ohio: About the same amount of scab this year as last. Leaf infection moderate to severe and occurred in June. Early fruit infection took place about July 25 and in some orchards was severe. Only a moderate amount of late fruit infection. Results of spraying this year have been variable. Bordeaux mixture as a pre-blossom spray was successful.

South Dakota: Disease very prevalent this year. Apples in the southern part of the state most affected.

Tennessee: Very slight amount of disease this year, occurring mostly on more mature fruit. Sprays applied for bitter rot are quite effective. The apple crop is very light this year and there are few reports of disease.

Mr. J. W. Roberts, Office of Fruit Disease Investigations, Bureau of Plant Industry, reports that only a very slight amount of scab occurs in Tennessee. No orchards seen where disease was serious.

Vermont: Very much less common and severe than last year. Only a moderate amount of leaf infection late in August. Fruit infection took place about August 15 when half grown.

Virginia: Not so prevalent as last year. Scab is not serious in the larger part of the state. A moderate amount of leaf and fruit infection occurred about June 13 while locally a considerable amount of late infection occurred August 1 as the fruit was reaching maturity. Spraying gives good control as a rule. Dusting is being taken up only experimentally. Sulfur dust controlled scab commercially in experiments this year but was not quite so efficient as lime sulfur.

Virginia (McClintock): Scab not observed in the vicinity of Norfolk since 1915.

Washington: Less disease reported this year than usual. Spraying has given good control in eastern Washington but poor in western Washington where it is less generally practiced. Very little dusting.

Below is given a table showing the varieties that have been reported from the various states by collaborators as being especially susceptible or resistant to scab this year.

Table 3.- Varieties of apples reported as being most, least, or only moderately affected with scab, with names of states from which such reports came.

Variety	States listing variety as most affected.	States listing variety as least affected.	States listing variety as moderately affected.
Alexander	Mich.*	--------	--------
Astrachan	Mich.*, Ohio	--------	--------
Baldwin	Mich.*	Conn., Ohio.	N. Y.
Baltimore	--------	Ohio	--------
Belmont	Ohio	--------	--------
Ben Davis Group	Ark., Mich.*, Va.	Ohio	--------
Boiken	--------	N. Y.	--------
Canada Red	Mich.*	--------	--------
Crab	N. Y.	--------	--------
Duchess	Mich.*	--------	Minn.
Early Harvest	Ohio	--------	--------
Fameuse	Mich.*, N.Y., Vt.	--------	--------
Gano	--------	Ohio	--------
Gideon	--------	Mich.*	--------
Greening	N. Y.	Vt.	Conn.
Grimes Golden	--------	Va.	--------
Jeffries	Ohio	--------	--------
Jonathan	--------	--------	Mich.*
King	--------	--------	Mich.*
Longfield	--------	--------	Mich.*
Lubsk Queen	Minn.	--------	--------
McIntosh	Conn., N. Y.	--------	--------
Maiden Blush	Ark., Mich.*, Ohio	--------	--------
Mammoth Blk. Twig	Ark.	--------	--------
Martha Crab	Minn.	--------	--------
Missouri Pippin	Ohio	--------	--------
Newtown Pippin	Ohio	--------	--------
Northern Spy	N. Y., Ohio	Mich.*	--------
Northwestern Greening	Ohio	Minn.	--------
Patten's Greening	--------	Minn.	--------
Ralls	Ohio	--------	--------
Rambo	Ohio	--------	--------
Rome Beauty	Ohio	--------	--------
Russet	--------	Conn., N. Y., Vt.	--------
Senator	Mich.*	--------	--------
Starr	N. J.	--------	--------
Tolman Sweet	--------	--------	Mich.*
Twenty Ounce	--------	N. Y.	--------
Virginia Crab	Minn.	--------	--------

Variety	States listing variety as most affected	States listing variety as least affected	States listing variety as moderately affected.
Wagner	--------	--------	Mich.*
Wealthy	--------	--------	Minn.
Winesap	Ohio, Va.	--------	--------
Winter Banana	Mich.*	--------	--------
Wolf River	--------	Mich.*	--------
Yellow Newtown	Va.	--------	--------
Yellow Transparent	--------	Mich.*	--------
York Imperial	--------	Va.	--------

*Report by Mr. Leslie Pierce, Office of Fruit Disease Investigations, Bureau of Plant Industry, for Berrien, Oceana and Grand Traverse Counties, Michigan.

Cedar Rust caused by Gymnosporangium Juniperi-virginianae.

Cedar rust is reported on September 15, 1917, as being severe on apples in the states of Arkansas, Minnesota, Mississippi, Pennsylvania, South Dakota, and Virginia; and moderate in Alabama, Colorado, North Carolina, and Ohio.

The greatest damage that has resulted this year has been from infection of the leaves. Reports of defoliation come from Arkansas and Virginia. Fruit infection is reported as being moderate to severe in Arkansas and Minnesota. The red cedar is common in all states heard from and in none are eradication methods being used except in Virginia where a cedar rust law is in operation.

Alabama: About the same as last year. First reported in March from Auburn. Infection of leaves and fruit slight. The disease is abundant on cedars which are common. The varieties of apple grown in the apple-growing sections are of a more or less resistant type which accounts for slight infection even when cedars are in close proximity to orchards.

Arkansas: Disease general. First reported in July. Leaf infection very severe. Some trees were nearly defoliated. Fruit infection only moderate. Red cedars are generally distributed throughout the apple-growing region but are not abundant. The best orchardists cut them out.

Colorado: Disease fully as abundant as last year. Leaf infection about the same but fruit infection small. Cedar and apple trees occur generally together. Control by eradication of cedars is not employed anywhere in the state. Jonathan is most affected while Maiden Blush and Winesap are least affected.

Connecticut: Not bad this year.

Michigan: "There is very little, if any, cedar rust in the state. Even where apples and cedars grow side by side we find no infection. Gymnosporangium globosum is common, causing rust on Crataegus, and

G. aurantiacum caused much loss on quinces. It is difficult to explain the freedom of Michigan apples from rust in view of the extensive occurrence in Wisconsin. Doubtless the scarcity of red cedars has something to do with it."- E. A. B.

Minnesota: More prevalent than for some years, especially on the fruit. First reported June 20. Leaf infection was very severe and fruit infection moderate to severe when near cedars. Red cedar is grown mostly as an ornamental, either isolated or in hedges, and in some districts is native. Little or no cedar eradication is practiced as the apple is not of sufficient importance to warrant such a measure. Wealthy and crab apples are most affected while Greenings, Okabena, Hibernal and Duchess are practically immune.

Mississippi: About the same amount as last year. Leaf infection severe in places. Fruit infection very slight. Commercial apple growing not practiced in the state.

New Jersey: Slight amount of disease, of very little importance.

New York: About the same as last year. First reported June 4 from Long Island. Not a serious disease, especially in the northern part of state. Red cedars scattered all over the state and often abundant about orchards. No cedar eradication has been practiced. Jonathan and Wealthy reported as being most affected this year.

North Carolina: First reported June 12. From reports received the disease was abundant locally. Red cedars are commonly present west of Raleigh in the part of the state where apples are grown.

Ohio: About the same as last year. Reported first July 10. Leaf infection quite severe but only slight fruit infection. Red cedar is abundant over the southeastern portion of the state. It is a real menace to the southeastern apple district. Eradication is being practiced only locally by some growers. Varieties most affected are Wealthy, Jonathan, Ben Davis and Lowell. Variety least affected is Stayman, Winesap. Spraying only moderately effective.

South Dakota: First reported May 15. Leaf and fruit infection severe. Cedars very prevalent in southern part of state. Wealthy most susceptible.

Tennessee: About the same as last year. Leaf infection moderate. No disease noticed on fruit. Cedars abundant all over state.

Texas (Taubenhaus): No record of disease on apples this year. Plenty of cedar rust and cedars.

Virginia: Rusts are more severe than last year. First reported July 1. Heavy defoliation occurred, resulting in considerable under-sized fruit of poor quality. Considerable infection of fruit occurred locally, especially in Shenandoah County. Red cedars occur in great abundance throughout the state, being especially prevalent in apple-producing sections. A cedar rust law is in operation in certain parts of the state. Varieties most affected York Imperial, Northern Spy, Wealthy, Rome, Jonathan, Smith Cider. Varieties least affected Northwestern Greening, Stayman, Winesap, Arkansas,

Grimes, Yellow Newtown. Spraying gave poor results unless it was applied at just the proper time and that cannot be foretold.

Washington: No disease in state.

Bitter Rot caused by Glomerella rufomaculans.

Bitter rot is reported as doing an average amount of damage this year in the belt where it normally occurs. Reports indicate its severity in Virginia, North Carolina, Arkansas and Texas.

Alabama: Disease not important.

Arkansas: More prevalent than last year. First reported in August at a time when seeds of Ben Davis variety were beginning to turn dark. Disease not especially severe. It is estimated that ½ to 1% of the fruit is affected. Ben Davis group most susceptible. Spraying completely controlled the disease in good commercial orchards.

Mr. J. W. Roberts, Office of Fruit Disease Investigations, Bureau of Plant Industry, reports the occurrence of bitter rot in Arkansas as early as July, at a time when the fruit was about half grown. The variety Givens most affected.

Colorado: Does not occur in state as a serious disease. Climate too dry.

Connecticut: Of little importance. Occurs chiefly in storage or on early varieties.

Michigan: Only present in state under extraordinarily wet conditions.

Minnesota: Seldom occurs. None this year.

Mississippi: No complaints this year. Climatic conditions are apparently such as to keep the disease in check.

New Jersey: Less than usual.

New York: Disease never very serious. Reported once this year, June 20.

North Carolina: About the same as last year. Very generally present and the cause of considerable loss. First reported July 20 at a time when the apples were nearly ripe. 25% of fruit affected. No difference in varieties noticed.

Ohio: No reports this year.

Tennessee: Disease slight this season. Very few reports received. Spraying has been very effective wherever practiced.

Texas (Taubenhaus): Fairly prevalent on ripe fruit. Controlled by spraying.

Vermont: Disease not observed.

Virginia: About same as last year. Not very severe except locally. First reported July 1 on half grown fruit. Yellow Newtown and Ben Davis most affected. Winesap and York Imperial least affected. Control very satisfactory where ample and thorough spraying is practiced.

Washington: No bitter rot in the state.

Other Diseases.

Alabama: "The two most important apple diseases are blotch and black rot. Practically all loss of fruit due to the black rot fungus. Almost all cankers found in state are those caused by the same organism. All orchards cared for very poorly. No thorough or efficient spraying done." G. L. P.

Arkansas: Black rot caused by Physalospora cydoniae (=Sphaeropsis malorum) is the most general and severe apple rot in the state. 50% infection occurs in unkept orchards and from ½ to 1% infection in many good orchards. Sooty blotch not severe.

Mr. J. W. Roberts, Office of Fruit Diseases, states that blister canker caused by Nummularia discreta is one of the most serious diseases in Arkansas and Missouri. He also reports considerable amount of black rot on fruit following hail injury in various parts of state.

Connecticut: Fruit spot caused by Phoma pomi not so bad as last year. Sooty blotch no more prevalent than usual.

Michigan: Black rot attacked early apples and rotted them on the trees in some instances. Percent of loss was small however. The leaf spot form not observed and the canker about as prevalent as usual.

Minnesota: "Black rot cankers are very prevalent. This is probably due to the large amount of fire blight during the last few years. The black rot fungus seems to follow the blight injury and is now quite prevalent and destructive. It is fairly abundant on leaves in some orchards but can not be considered of first importance. No reports of its occurrence on fruit have been obtained."- E. C. S.

Mississippi: Blotch caused by Phyllosticta solitaria abundant in some orchard

New York: Stippin or bitter pit reported several times this season. Leaf spot and canker caused by Physalospora cydoniae are troublesome. The fruit rot form is never serious.

North Carolina: Blotch caused by Phyllosticta solitaria is the most serious apple disease except blight. Sooty blotch caused by Leptothyrium pomi universally present in the state.

Ohio: Leaf spot caused by Physalospora cydoniae prevalent. Blotch, stippin, fruit spot and sooty blotch collected this year. An undetermined root rot is present in closely planted trees at Wooster.

Tennessee: Black rot, leaf spot and canker caused by Physalospora cydoniae common.

Texas: (Taubenhaus): Blotch caused by Phyllosticta solitaria prevalent. Physalospora cydoniae is very prevalent this year, especially the leaf spot form which caused heavy defoliation.

Virginia: "A special survey has been made for black root rot of apple caused by Xylaria spp. It has been found throughout the apple-producing sections of the state and in the opinion of some growers is more destructive than all other diseases of the apple combined. I have found tree losses running as high as 25% in 20 yr. old orchards. A 5% loss in bearing orchards would certainly be a conservative estimate for the general run of infested orchards, and in some districts fully 50% of the orchards are infested."- F. D. F.

Virginia: (McClintock): Sooty blotch very common on all varieties.

Washington: Northwestern anthracnose caused by Neofabraea malicorticis is about the same as formerly on apple and pear.

Powdery mildew caused by Podosphaera leucotricha common but not so serious as during the past two years. Stippin or bitter pit (phys.) serious, especially in irrigated sections.

CABBAGE

Club Root caused by Plasmodiophora brassicae.

Additional reports received on the occurrence of club root show that the disease does not occur in either North Dakota or Nebraska. In Connecticut it is reported as causing injury in places. One farmer reports 80% of the plants diseased in seed bed.

Cabbage Yellows caused by Fusarium conglutinans.

Michigan: Disease has been reported from 4 localities in Michigan. It is not known how much of a factor it is in the cabbage fields.

Nebraska: One infected field found this year for the first time. This was at Kimball and was first noticed in July. Probably 5% of the plants were affected.

Wisconsin: (Extract from Michigan Dept. Botany News Letter, Sept. 22.) "Cabbage fields were visited at Racine, Wisc. during the week of Sept. 9 to 15. The tests of resistant cabbage are located here and do not show so well as in other years because of the complicating black leg and black rot, but so far as Fusarium disease (yellows) is

concerned, the tests are striking. Rows were seen with 90% marketable cabbage grown from resistant seed and contrasted with these were checked rows from commercial seed showing 90% yellows, 10% sound."

Black rot caused by Bacterium campestre.

Michigan: Disease found doing 25% damage in one small field at Manistique.

New Mexico: Quite a number of specimens of cabbage plants showing black rot have been received from Valencia County.

CORN

Smut caused by Ustilago zeae.

Connecticut: About the same amount as usual. First appeared early in July. Does not appear to be increasing.

North Dakota: Not so much as usual. Slow growth conditions of the crop in the spring and continued dry weather probably unfavorable. First noticed July 25 at Fargo. Disease is not increasing in corn region. It was always quite abundant even on new prairie land far distant from corn cultivation. There is a possibility of its being carried internally in seed. Has been observed on all kinds of land and at various elevations.

OATS

Smut caused by Ustilago avenae and U. levis.

Idaho: Less than usual as more seed is being treated. Appeared about July 25. Loss in untreated fields up to 25%. Treatment effective. About 95% of seed oats treated this spring. Counties not having county agents are in need of demonstration work.

PEACH

Leaf Curl caused by Exoascus deformans.

Leaf curl did more damage to peaches this past season than for a number of years. The cold, wet weather of spring delayed the opening of the buds and gave a comparatively long period during which infection could take place. It is probable that this, together with the abundance of moisture, was responsible for the unusually large amount of curl.

Alabama: Much more severe than last year, due to favorable weather conditions. Somewhat severe on seedling peaches.

Colorado: Disease not noted this season.

Connecticut: More prevalent this year than for a long time. First reported in June from all over the state. Prompt spraying kept almost all of the orchards fairly free but unsprayed ones had great amount of the disease. Elberta most affected.

Florida: Has not been observed in the past few years.

Louisiana: Disease does not occur.

Michigan: Not so much disease this year as last. First noticed about May 20. Defoliation occurred in many cases. Fall spraying is not advocated by the Entomology Department of the College. It was tried out to some extent as early as 1895 but never became popular.

(Berrien and Oceana Counties as reported by Mr. Leslie Pierce, Fruit Disease Investigations, Bureau of Plant Industry): About the same as last year. First reported June 1. On unsprayed trees 50% of the leaves affected. Fall spraying practiced in about 90% of the orchards.

Mississippi: Disease never common or important but occurred occasionally this year. First appeared April 1.

New Jersey: Severe in northern part of state. About half the orchards are sprayed in the fall.

New York: Leaf curl unusually severe this year. It has been estimated that 48% of the leaves on affected trees throughout the state were diseased. Results of fall spraying this season were superior to those secured from applications in the spring. A more detailed report has already been made and published in Plant Disease Bulletin No. 2, 1917.

North Carolina: More curl than last year. First appeared May 14. Most serious in western part of state. Fall spraying not generally practiced.

Ohio: About the same amount as in 1916. Conditions are favorable each season. First appeared about June 1. Elberta and Crawford most affected, Smock and Salway types least affected. Fall spraying quite largely practiced. Some complaint of lack of control this past year.

Virginia: More prevalent this year than last. Cool, damp spring affected development. First appearance about April 25. Very heavy infection on trees not receiving a dormant spray. Practically all commercial growers make this application.

Washington: Disease prevalent in about the same amount as last year. First reported May 15. Winter spraying is very generally practiced.

Scab caused by Cladosporium carpophilum.

Alabama: Very little on leaves and fruit although plentiful on twigs. First reported in June. Not economically important.

Arkansas: Disease general, first occurring in July. No loss in well kept orchards but much damage in poorly kept ones. Spraying with lime-sulfur and Bordeaux is generally practiced with good results.

Connecticut: Scab generally appearing in August. Elberta most affected, Champion least affected. Spraying for scab is not generally practiced although it can be controlled by the proper applications.

Florida: More or less common each season. Very little spraying.

Georgia: (J. W. Roberts, Fruit Disease Investigations, Bureau of Plant Industry): Very slight amount. Spraying with self-boiled lime-sulfur generally practiced. Sulfur dust employed to some extent. Results of the spraying this year are good.

Louisiana: Rather common but not serious.

Michigan: Disease present. Peaches are so scarce this year that deterioration of this kind is not charged against stock.

(Berrien and Oseana Counties as reported by Mr. L. Pierce, Office of Fruit Disease Investigations, Bureau of Plant Industry). Scab has not been of any commercial importance for the past two seasons. About 40% of the orchards in these counties are sprayed with self-boiled lime-sulfur. Perfect control is secured.

Mississippi: Scab very common. First reported May 15. Loss slight because most peaches grown here are consumed at home. Lime-sulfur is used very little but effective where applied.

New Jersey: About the same amount as last year. Lime-sulfur is used on about half the orchards with excellent results.

New York: Slight amount all over the state. First reported July 16. Very little spraying for scab is carried on.

North Carolina: Scab very common. First reported July 3. Early varieties had only little scab but all late varieties badly affected.

Ohio: Scab prevalent in about the same amount as last year. Very little loss. Varieties most affected Salway, Lemon Free, Morris, White Smock, and late Heath. Varieties least affected Elberta and Crawfords. In the Peach Belt spraying with selfboiled lime-sulfur was practiced to a considerable extent.

Tennessee: Very slight this season.

Virginia: Prevalent in about the same amounts as usual. First reported July 1. Late varieties most affected. Practically all commercial growers spray with self-boiled lime sulfur 8-8-50. Three summer applications gave 95% control.

Brown Rot of Stone Fruits caused by Sclerotinia cinerea.

Brown rot occurred this season with varying intensities in different states and on various hosts depending on local weather conditions and stages of the host plants. Considerable blossom blight of all stone fruits is reported from the northern states and severe loss from the rotting of cherries has been experienced in Michigan, Ohio, New York and Connecticut. The dryer weather of middle and late summer did much to lessen the injury to the fruit of peaches, plums, etc. The greatest damage to peaches occurred in the South Atlantic states where the summer rainfall has been abundant.

Alabama: About the same this year as usual. Late infection on unsprayed peaches.

Arkansas: Slightly prevalent, beginning in August. Very little early infection of peaches but none of plums. There was considerable rotting of peaches this year which seems to be largely due to Rhizopus.

Colorado: Very little damage this season. Climatic conditions unfavorable.

Connecticut: A scant amount on peach and plum. Very bad on cherry, especially the sweet varieties. Wet weather at the ripening time was the most important factor. Early peach varieties, such as Champion, more affected than late varieties.

Florida: Prevalent as usual. Late infection severe on peaches. Most severe during June, July and August which is the rainy season.

Georgia: (Fort Valley Section as reported by J. W. Roberts, Fruit Disease Investigations, Bureau of Plant Industry) Slight amount of disease only on peaches this year.

Louisiana: No report. Disease usually present in small amounts.

Michigan: 50% of the unsprayed cherries were destroyed. Weather at harvest time extremely wet. There has been little or no loss to plums or peaches so that the injury to these fruits is much less than usual.

Minnesota: About the average amount or possibly less this year, occurring mostly on plums early and late. Cool, dry weather probably inhibited its development. Considerable blossom blight on plums.

Mississippi: Not so much as usual. Small amount of early and more late infection of peaches. Common but not severe on plums. Hairy or fuzzy varieties mostly affected but disease is found on all. The precipitation has been light this season and conditions have not been favorable for brown rot.

New Jersey: Common in unsprayed orchards. Severe after blossoming. Affected by wet weather. Triumph and Champion peaches most affected. Elberta and Belle varieties least affected.

New York: Serious this season on cherries, not so serious on peaches. The disease seems to be increasing on apples, at least there are more reports of it each year. On plums the disease is reported as being common in nine counties and on cherries abundant in twelve counties.

North Carolina: Very severe on peaches, occurring late in the season. Frequent showers favored the outbreak. All varieties except the early maturing ones were affected from 1-75%. Disease most common on peaches and yearly causes very serious losses.

North Dakota: "Practically none observed on cultivated or wild plums which are the only available stone fruits. The only opportunity this disease would have in North Dakota would be to affect native wild plums, pin cherries and choke cherries and the cultivated varieties known as Compass cherries. So called brown rots of these fruits have never been particularly noticeable." H.L.B.

Ohio: Less than usual. First reported July 2. Slight amount of late infection on peaches, moderate to bad amount of early infection on plums, and a quite severe early infection of cherries. Duke and sweet cherries most affected. Sour cherries least affected. Of the plums the European varieties suffered most. The crop of cherries is too light to furnish much data. Plum crop also short.

Tennessee: Less than last year. First reported July 1. Only a slight amount of disease on peaches and plums. Alexander most affected. Greensboro least affected. Very small peach crop in the state.

Vermont: About the same amount as usual, occurring late on plums.

Virginia: Not so severe or generally prevalent as last year. Severe on peaches, occasional on plums and rare on cherries. Hot, dry summer evidently checked the disease on peaches. Early Crawford, J. H. Hale, and Champion most affected. Belle, Carmen and Elberta least affected.

(McClintock): Serious this year in this region. Appeared early in July. Heavy rains favored development.

Washington: Less than usual, occurring on prune, peach and cherry. The dry summer has lessened the severity to a marked extent. Blossom blight of prune is very important in Clarke County. Does not occur in state east of the Cascades but present more or less throughout the coast counties.

Other Diseases.

Connecticut: Yellows more common this year than usual. Winter injury, collar girdle type, very bad last winter. As the result of this injury trouble similar to yellows is showing up on many trees.

Louisiana: "Bacteriosis is most serious disease of peaches in state, doing considerable damage to peach trees of all ages. A dying of the buds, probably winter injury, is of considerable importance. Peach leaf rust is also common during fall months and must weaken the vitality of the trees."- C. W. E.

Michigan: (Berrien and Oceana Counties, Mr. L. Pierce, Fruit Disease Investigations, Bureau of Plant Industry). Black spot caused by Bacterium pruni shows on possibly 10% of the fruit and 25% of the foliage in this region.

North Carolina: "Bacterium pruni was observed only in the orchard of Experiment Station grounds July 11. Variety Lady Ingold only one severely affected. These trees were practically defoliated by the middle of July and every fruit on the trees was fissured and checked. One report of this disease on plums came from Charlotte."- F. A. W.

Ohio: "Winter injury exhibited unusual forms, notably that of killing all buds within 4 to 10 inches of the ends of the shoots. These shoots remained green in most areas. Pronounced lateral branching has resulted. Heavy pulling of peach orchards reported from Lake area."- A. D. S.

PEAR

Fire Blight of Pear, Apple, Quince, etc., caused by Bacillus amylovorus.

This disease occurred in about the same quantities, or in less amounts, than usual. Blossom blight followed by infection of the twigs was the most common form of the disease. In Alabama, Mississippi and Louisiana Sand pears are about the only kind that can be grown on account of blight.

Alabama: Average amount of disease. All forms of blight were severe on pear, slight on quince and slight to moderate on apple. Practically the only variety of pear now grown in Alabama is the Sand pear which is almost resistant to blight. The disease is the limiting factor to the successful growing of pears in the state.

Arkansas: The same as last year. Very severe on pears, attacking both twig and blossom. Slight amount of blossom blight on apple. All varieties of pear blight severely. Yellow Transparent most susceptible of apple varieties.

Colorado: About an average amount. Most abundant in the smaller farm orchards. Blossom and twig blight severe on apples and pears with a moderate amount of body blight on these hosts. On the western slope the Bartlett, Flemish Beauty and Chairgeau are very susceptible. Among the most resistant varieties are the Anjou, Mt. Vernon, Suduth and Kieffer. The most susceptible apples are Jonathan, Red Mountain, Transcendent crab and Peewaukee.

Connecticut: No more than average, perhaps less than last year. Twig blight occurs in moderate amounts on pear, slight amounts on quince, and very slight amounts on apple.

Florida: About the same as usual. Blossom blight slight, twig blight severe on pears.

Louisiana: About the same as usual on pears. Blossom and twig blight severe, body blight slight. Sand pears showed resistance. Most other varieties badly affected.

Michigan: "Less blight this year than usual. In spite of extensive aphid attack and in spite of a great deal of blight last year our predictions of severe fire blight epidemics were not borne out. Can only guess that hot, dry weather of last season caused a lessening of hold-over cankers." - E. A. B.

(Berrien and Oceana Counties, reported by L. Pierce, Office of Fruit Disease Investigations, Bureau of Plant Industry.): About the same as last year. First reported June 10. Twig blight slight on pear, very slight on apple and quince, body blight very slight on pear. Yellow Transparent and Alexander are the most susceptible of apple varieties and Kieffer most resistant of pear varieties.

Minnesota: Less than usual, occurring on apples to slight extent. Virginia Crab, Wealthy, Duchess and Greening are most susceptible. Much black rot canker is following the injury of previous years.

Mississippi: About the same as last year, occurring in large amounts. Severe on pear and moderate on apple. All varieties of pears are more or less affected, usually severely.

New Jersey: Less than last year.

New Mexico: Increasing in northwestern part of state.

New York: Not as much fire blight this year as usual. According to plant disease reporters the varieties Bartlett, Clapp's Favorite, and Bosc, listed in order of importance, are the most susceptible to blight this year. Kieffer and Seckel are most resistant. Of the apples Rome Beauty, Wealthy, Twenty Ounce and Sutton are most susceptible and Baldwin most universally resistant.

North Carolina: Blossom and twig blight severe on apples in a few localities. The disease occurs in almost every orchard.

North Dakota: "Not as serious as usual, probably due to slow spring growth conditions and following dry weather. Twig blight a common form on apples. Mountain ash was badly affected. A great many trees were dying when dry weather came. Hybernal and Patton's Greening most resistant in this region. Siberian Crabs and Mountain Ash non-resistant. In seasons of rapid growth none of the apples are thoroughly resistant. Disease is very destructive after winter freezing and sun scalding on the body of the tree." - H. L. B.

Ohio: Much less than usual. Severe to moderate on pears, moderate to very slight on apples. Jonathan, Yellow Transparent, Grimes and others have proven very susceptible. Winesap, Rome Beauty, Newtown Pippin, Late Strawberry, Ben Davis, Baldwin and Baltimore mostly resistant.

South Dakota: Very prevalent the last three years.

Tennessee: Less than last year. Severe on pear and quince, moderate on apple. Late blossoming varieties most severely attacked.

Vermont: Not observed this year but common last year.

Virginia: About the same. Twig blight and body blight of apples severe. Disease was severe in some localities this year where there was practically none last year and places with heavy infection in 1916 had little in 1917.

Washington: Much less than usual with a moderate amount of twig blight on all hosts.

Scab caused by *Venturia pyrina*.

New York: Prevalent in about the same or slightly larger amount than usual. Records of occurrence have been received from twenty-one plant disease reporters in fourteen counties of the state. First report came from Yates County June 2. In some regions nearly all leaves on susceptible varieties are affected and in Orleans County nearly 90% of the fruit of Bartlett and Clapp's Favorite are said to be seriously diseased.

Table 4.- Resistance and susceptibility of pears to scab in 1917 as shown by New York plant disease reporters September 22.

Variety	Number of reporters listing variety as: Most affected	Least affected	Variety	Number of reporters listing variety as: Most affected	Least affected
Flemish Beauty	5	0	Seckel	2	2
Duchess	4	0	Kieffer	0	4
White Doyenne	2	0	Anjou	0	1
Bartlett	3	3	Sheldon	0	1
Clapp's Favorite	1	0	Vicar	0	1

PEPPER

Pod Canker and Mosaic.

Mr. G. H. Godfrey, Office Cotton, Truck and Forage Disease Investigations, B. P. I., who spent Sept. 27, 28, and 29 in Pennsylvania and New Jersey trucking sections, reports in a letter dated Sept. 28: "I spent yesterday and today in

Pennsylvania and New Jersey looking into the potato and rhubarb troubles. I find peppers badly injured (10% or more) with pod canker, also more than 50% of a large field with mosaic."

Fusarium wilt of Chile Pepper (Capsicum sp.).

New Mexico: Sept. 1, 1917. "Wilt of the Chile pepper is worse this year than ever before. It first appeared in 1908, has increased from year to year, until now we have from 25-100% of the crop affected, in some cases causing total loss of the crop. This disease is most common in Dona Ana, Lincoln, Valencia, Bernalillo and Sandoval Counties. In Valencia and also in Bernalillo Counties I have seen fields two weeks ago in which about 95% of the crop was wilted. Dona Ana and Valencia Counties are the center of raising the Mexican Chile on a commercial basis. This year's loss caused great discouragement among the growers. I have isolated a Fusarium from many diseased Chile plants and inoculation experiments have proven its pathogenicity."- F. C. W.

WHEAT

Black Chaff Disease.

North Dakota: "As so far located, the disease does not show symptoms of being particularly destructive. It may be that this bacterial disease may have more importance than we have heretofore associated with bacteria in the matter of injury to germination. This is a point worth considerable study, particularly in the Durum wheats. Heretofore it has been usually assumed that the scab organism and other Fusarial types were the chief causes of failure to germinate when seed is not otherwise injured by climatic conditions."- H. L. B.

THE PLANT DISEASE BULLETIN

Issued By

The Plant Disease Survey

Number 5, October 15,

1917.

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

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	E. C. Stakman
Mississippi:.....	J. M. Beal
Missouri:.....	G. M. Reed
Montana:.....	D. B. Swingle
Nebraska:.....	E. M. Wilcox
Nevada:.....	C. W. Lantz
New Hampshire:..	O. R. Butler
New Jersey:.....	M. T. Cook
New Mexico:.....	F. C. Werkenthin
New York:.....	H. H. Whetzel
	E. W. Olive
	C. Chupp
North Carolina:.	F. A. Wolf
North Dakota:...	H. L. Bolley
Ohio:.....	A. D. Selby
Oklahoma:.....	C. D. Learn
Oregon:.....	H. P. Barss
Pennsylvania:...	C. R. Orton
	F. D. Kern
Porto Rico:.....	J. A. Stevenson
South Carolina:.	H. W. Barre
	R. C. Faulwetter
	J. L. Seal
South Dakota:...	C. W. Michel
Tennessee:.....	S. H. Essary
Texas:.....	F. H. Blodgett
	J. J. Taubenhaus
Utah:.....	G. R. Hill, Jr.
Vermont:.....	B. F. Lutman
Virginia:.....	F. D. Fromme
	J. A. McClintock
Washington:.....	F. D. Heald
West Virginia:..	N. J. Giddings
	J. L. Sheldon
Wisconsin:.....	L. R. Jones
	R. E. Vaughan
Wyoming:.....	J. F. Groves
	Aven Nelson.

ANNOUNCEMENT

The collecting of timely information on diseases of the principal food crops through the system of special disease reports and the distributing of this information by means of the Plant Disease Bulletin has apparently met with a large measure of success. This has been due to the hearty cooperation of collaborators and others concerned. Now that the growing season is practically over the Bulletin for 1917 will be discontinued with this number. Since the publication may have some value as a source for reference however, an index for all the 1917 numbers is being prepared and will be mailed shortly. Next season the value of the Bulletin should be materially increased because of improvement in the facilities for collecting information and for issuing the Bulletin promptly.

Work is now under way on the preparation of an annual report. Requests for contributions to this report have been made already to collaborators and certain other plant pathologists. It is planned to utilize all possible sources from which information may be obtained. Readers of this Bulletin are urged to send in any authentic records they may have concerning the occurrence, prevalence, severity, etc., of plant diseases during the past year.

CONTENTS OF THIS NUMBER

The present number of the Bulletin contains summaries of the results obtained by twelve field assistants who made a survey for the disease of corn caused by Physoderma and for potash hunger and certain boll rot diseases of cotton. Work was started in the states of Louisiana, Mississippi, Alabama, Georgia and North and South Carolina. From these states the men moved northward and westward, going into all states with the exception of New England, North Dakota, Montana, Idaho, Utah, Arizona, Nevada, California, Washington and Oregon.

CORN

Disease caused by Physoderma zeae-maydis.

In the first issue of the Plant Disease Bulletin, pages 9 and 10, there was given a summary of the distribution of Physoderma zeae-maydis Shaw on Indian corn as known at that time. The disease was prevalent in North Carolina, South Carolina, Georgia, Florida, Alabama and Mississippi. During July and August, Professor S. H. Essary, Plant Disease Survey collaborator for Tennessee, found it to be widely distributed in that state.

In a later issue (Pl. Dis. Bul. 1917: 52) it was further stated that the Plant Disease Survey was sending into the field a force of twelve scouts to study the disease. This survey was undertaken after close consultation with the Office of Cereal Investigations, particularly with Dr. W. H. Tisdale. The scouts were assembled at Clemson College, S. C., September 10-13, where they were given careful instruction by Dr. Tisdale in recognizing the disease and in methods of collecting the information desired. They were then sent into the field with special report blanks for recording their observations. Specimens were sent to this office from all points visited that the scouts' findings might be checked up by microscopic examination of the material.

INFORMATION DESIRED

Information was desired on the following general topics:

1. Distribution of Physoderma beyond the borders of the seven states named above, with data on its rate of spread and the nature of the menace to the corn belt of the north and middle west.
2. The influence of environmental factors, such as climate, soil and elevation.
3. The general nature of the disease, parts of host plant attacked, injury caused and resulting damage to the corn crop.
4. Dissemination of the causal organism with special reference to its presence on other hosts than corn.

Data on these points were needed by Dr. Tisdale in his researches on the disease. The potential menace to the northern corn belt was a matter of great importance in view of the present food situation.

METHOD OF WORK

An intensive study was made of restricted regions in North Carolina, South Carolina, Georgia, Alabama and Mississippi, to obtain data on the last three topics mentioned above. This occupied between three and four weeks. About October 7 the scouts moved north and west to obtain data on the distribution of Physoderma and if possible to map its present limits. This occupied about one month and it was found that the disease had spread much farther than had been anticipated.

A little later the Plant Disease Survey collaborators will be sent more detailed summaries of the data gathered in their respective states.

RESULTS

The following summary of results has been prepared in consultation with Dr. Tisdale:

1. Present Distribution. Physoderma was found to be prevalent in Louisiana, Arkansas, eastern Texas, and Oklahoma, southeastern Missouri, southern Illinois and Indiana, Kentucky, and along the Atlantic Coast as far north as southern New Jersey. It occurs sparsely both to the west and north of these limits, the most northern collection being made at Passaic, N. J.; Winona, Minn.; and Yankton, S. D., the most western at Central City, Nebr.; Chickasha, Okla.; and San Antonio, Texas. Nineteen states have been added to the list of those having Physoderma, making twenty-six in all.

In the northern and western regions prolonged search in a locality sometimes yielded only one or two diseased plants, thus making it largely a matter of chance whether or not the scout found the disease. The fact that the corn was dry and largely harvested also increased the difficulties. If the survey had been made one month earlier we should undoubtedly have located the disease in many places where the scouts have now reported it as not present.

The accompanying map shows the present known distribution of the disease. It is altogether probable that Physoderma occurs in favorable localities, and during moist hot seasons, to the north and west of the points indicated, but our scouts were unable to find it this fall.

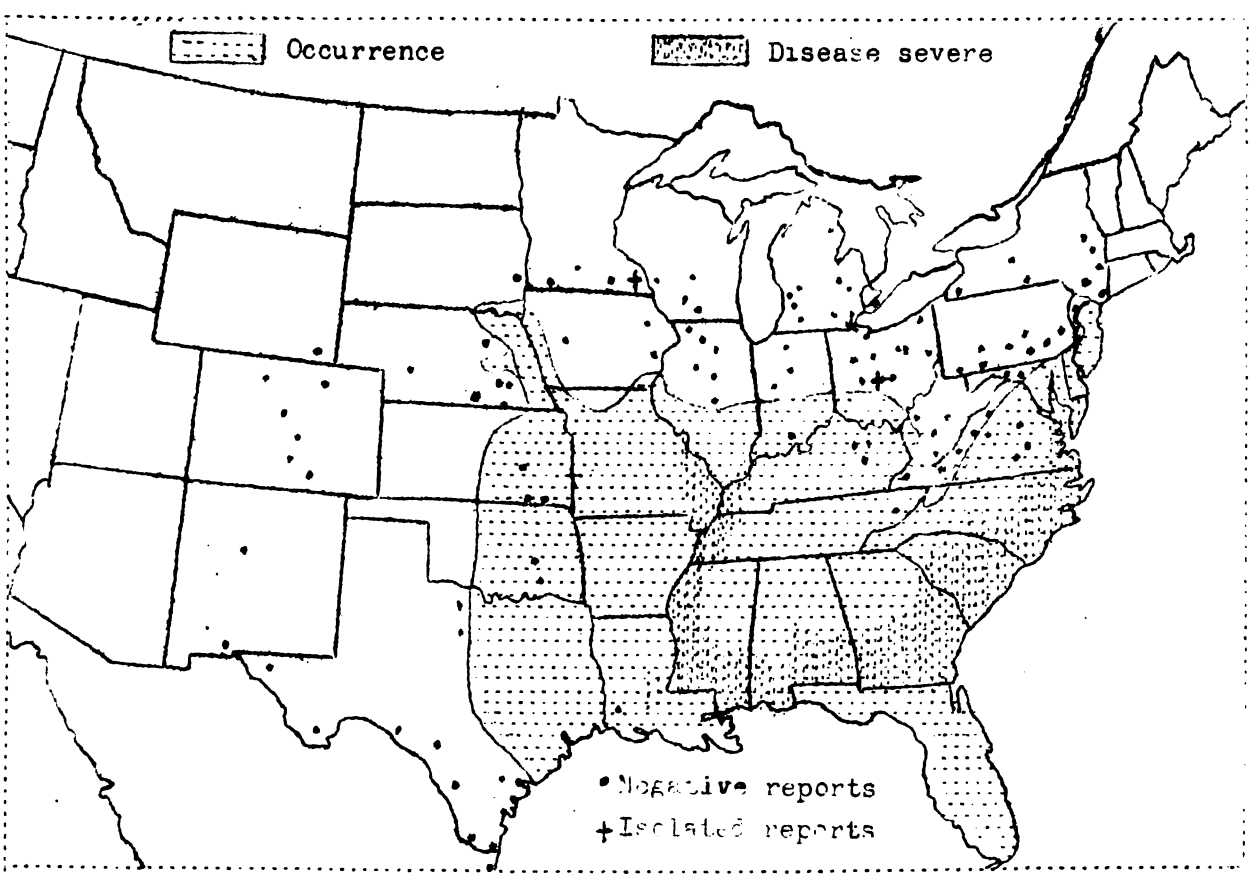

Fig. 6.- The occurrence of Physoderma zeae-maydis on corn during the season of 1917.

Unquestionably Physoderma has been in the United States many years and has spread almost, if not quite, to its northern and western limits where it is held in check by factors to be mentioned later, especially low temperature in the north and lack of sufficient moisture in the west.

2. Environmental Factors Influencing Development.

A. Temperature and Moisture. A proper combination of continuous high temperature and considerable precipitation is necessary for the extensive development of Physoderma and this must come during the early half of the life of the corn plant if great damage is to result. Infection late in the season may cause abundant development on leaves and sheaths without materially injuring the grain. In dry regions the disease is more pronounced on corn near water or on low wet land, probably on account of the moister atmosphere in these regions. As a rule heavy stands of corn are injured more than light ones, doubtless due to the fact that in heavy stands moisture is held longer in buds and sheaths. For the same reason large plants suffer more than neighboring small ones.

B. Elevation. Physoderma was at first reported as a lowland disease. It appears, however, that the controlling factors are temperature and moisture rather than elevation, little noticeable difference being found this year in the amount and severity of the disease on high or low land, provided the elevation was not sufficient to cause cold nights and to influence the precipitation. The disease was found at many points in the Blue Ridge Mountains up to 3,000 feet or more but it was not abundant or severe there, probably on account of the cold nights.

C. Soil Type. Physoderma was found on all types of soil and the influence of soil is evidently slight or wanting except as soil moisture may influence atmospheric moisture.

3. Nature of the Disease. Blade infections are very common but in general of minor importance. Infections of the sheath are even more common and of greater importance, the sheaths frequently being rotted through at the nodes. Spores are washed down between sheath and stalk where they find optimum conditions for germination. Stalk infection normally follows heavy sheath infection, the stalk in severe cases becoming so weakened as to break off.

4. Damage. Early reports of losses due to Physoderma were very conflicting, ranging from zero to 50% or over. Scouts were instructed to make very careful estimates of loss based on accurate counts. Injury to the grain only was considered. The greatest losses occurred this year in the coast regions of the Carolinas and Georgia, the Gulf and Delta regions of Mississippi, and certain other warm areas with heavy rainfall in the early summer. Here the damage was commonly 5% and sometimes as high as 8-10%. In most other portions of the country the season was too dry for heavy development of Physoderma. Considerable damage was also reported in the Mississippi Valley as far north as southern Illinois and Missouri. Aside from the regions mentioned the damage in the south this season was from 1-2% or less, while in the north and west it was negligible. Considering the infected area as a whole the loss for this year is not a large percent of the crop, although the aggregate total is considerable.

During normal years the losses will probably be confined largely to the south Atlantic and Gulf states, to the lower Mississippi Valley and to any other localities with continuous high temperatures through the summer, and with considerable rainfall, especially in the early corn season. Under exceptional conditions, considerable damage may be expected well up in the Mississippi Valley but during most years in the north the cold nights and cold rains during the early corn season will check development of the disease and later on there is usually too little moisture. In the western and southwestern regions there is insufficient precipitation.

5. Factors Influencing Dissemination. Continuous cropping of land to corn, which occurs in certain swamp lands and overflow lands in the south results in an increasing amount of infection. The disease was often found to be most severe on fields which had been heavily fertilized with barnyard manure, into which spores had evidently been introduced on diseased corn used as fodder.

In a number of cases fields were found to be heavily infested where corn was seldom raised or where it had never been planted before. In some of these instances the seed had been obtained from an infested region. Although there is no evidence that the disease attacks the kernels the resting spores may easily cling to the seed and thus be introduced to new territory.

6. New Hosts. Careful watch was kept for other hosts of Physoderma and the disease was found on Teosinte at two points in South Carolina and one point in Louisiana. Mr. H. S. Stahl found considerable infection on Teosinte at Florence, S. C. Dr. Tisdale also located it at Clemson College. Somewhat later Mr. F. F. Blaine found Teosinte infected at Crowley, La., without knowing of the South Carolina finds. Careful watch failed to locate the disease on sugar cane, sorghum or wild grasses. The finding of Physoderma on Teosinte makes it possible that there are other hosts in this country, perhaps wild grasses, and that the appearance of the disease in fields never before planted to corn may be due to its presence on these wild hosts.

COTTON

Potash Hunger caused by insufficient potash.

Lack of potash in cotton produces the condition known to planters as "rust". The leaves take on a reddish color with yellow or reddish areas between the leaf veins. This is followed by fungus invasion and by defoliation.

The following summary of results of a survey by field scouts was prepared in collaboration with the Office of Cotton, Truck and Forage Disease Investigations, Bureau of Plant Industry:

Potash hunger occurs gnerally, with some exceptions, throughout the cotton growing area, causing losses varying from slight to as high as 200 pounds of lint cotton per acre. The accompanying map shows the areas where it has been located and percentages of loss (pounds per acre) as determined by field men.

As a rule potash hunger is much more severe on sandy or sandy loam soils than on clay or clay loam soils; and is worse on hard pipe clay soils than on porous clay loam, or than on sandy loams. In the few instances in which potash fertilizer was applied injury was nearly always prevented. Applications of sodium nitrate usually prevented defoliation of the plants by potash hunger, but it kept the cotton from maturing as rapidly as it should. Liberal applications of stable manure almost always prevented injury.

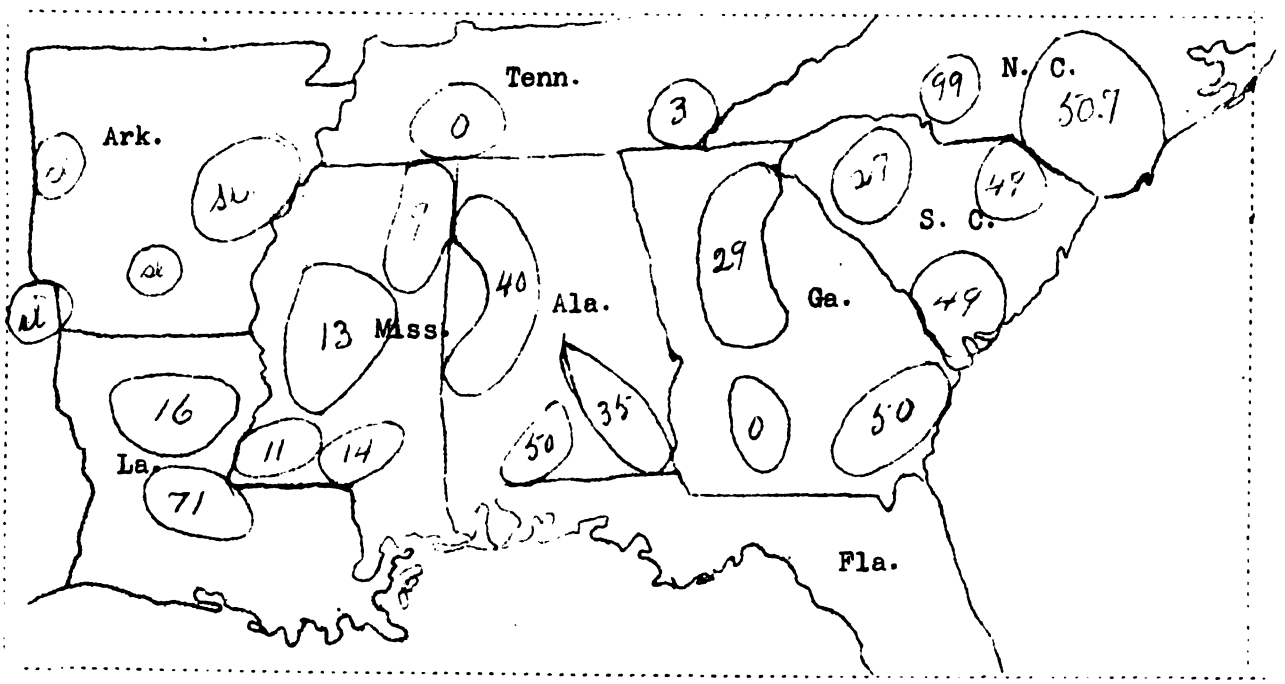

Fig. 7. Map showing cotton areas surveyed by field scouts for potash hunger. The figures represent average number of pounds of lint cotton lost per acre on account of the disease.

Alabama: Prevalent throughout this state, It is very evenly distributed, no one section being more seriously affected than another.

Arkansas: Very slight, when present at all. As a rule, the fields are not suffering from this injury. There were so few reports from this state that it is impossible to give anything specific.

Georgia: The injury is very general throughout the state. In the southeastern part there is a group of counties in which the loss is considerable, while in the southwestern section the counties which were surveyed are suffering very little loss, but potash hunger is present generally. In the northern part of Georgia where the soil is mostly loam, or sandy loam, with clay subsoil, the loss per acre is less than in other parts of the state but even here the damage is considerable.

Kentucky: Injury was found in Hickman County.

Louisiana: Potash hunger seems to be very serious in some localities and entirely absent from others. In Franklin and Ouachita Counties this injury is reported to be serious while in Lincoln, Webster, Winn and Rapides Counties the loss is very slight. On the whole, cotton in Louisiana is not suffering much from the disease.

Mississippi: Potash hunger is very slight in this state. It was reported not to be present at all in Madison, Yazoo, Sunflower, Montgomery and Grenada Counties. In a group of counties in the southern part of the state and in a group in the northern part of the state it was found to be present in some fields but not causing very much loss. It was worse in the low spots in the fields than on higher places.

North Carolina: As shown by the map, there is more loss per acre due to potash hunger in this state than in any other. It is very serious on the sandy soils, and also on what is called "blackjack" clays.

South Carolina: In the sand-hill section of this state, injury from potash hunger is very severe and almost every field shows the disease to some extent. While the map does not show so much loss per acre as in some other places, the injury is so generally distributed that the aggregate loss is great. In the Piedmont section considerable loss is being caused in certain localities but potash hunger is not so generally present as in the sand-hill section. In sections of Greenwood County, where the soil is a pipe clay, the cotton crop is reduced one-half.

Tennessee: While a few spots in cotton fields were injured by potash hunger wherever surveys were made in this state, the damage from it was very slight. Polk and McMinn Counties show more injury than the counties in the western part of the state.

Texas: Disease evidently present in many fields but on account of the fact that the cotton leaves had been killed by frost when the survey in this state was made, accurate percentages could not be determined. Apparently however, the disease is not causing much loss.

Boll Rots.

The data collected by the field assistants of the Plant Disease Survey on the occurrence of the various cotton boll rots were recorded by them on blank forms and sent directly to Mr. R. C. Faulwetter, South Carolina Agricultural Experiment Station, who is making a special study of these troubles. The facts on these diseases here presented were prepared from a summary of results furnished by Mr. Faulwetter.

Table 5.- The number of farms and the number of acres of cotton examined by field assistants during September and October 1917. The percentages of boll rot diseases were determined by counts in these fields.

State	Cotton acreage of state, census 1909.	Number of farms inspected.	Number of acres of cotton inspected.
Texas	9,930,179	9	153
Georgia	4,883,304	93	817
Alabama	3,730,482	77	1088
Mississippi	3,400,210	100	1543
South Carolina	2,556,467	44	729
Arkansas	2,153,222	4	57
North Carolina	1,274,404	22	1063
Louisiana	957,011	47	3618
Tennessee	787,516	24	157
		420	9225

Anthracnose (on cotton bolls) caused by Colletotrichum gossypii.

Reported as being slight in Alabama and Mississippi, due to the severe drought prevailing in that section in the early part of the summer. (See Fig. 7)

Diplodia Boll Rot caused by Diplodia gossypina.

This disease was severe in parts of Mississippi and Louisiana, particularly in low places and on the lower branches of the plants. The accompanying map (Fig. 8) shows the amount of infection in the various areas surveyed by the field men.

Bacterial Boll Rot caused by Bacterium malvacearum.

This disease seems to be very irregularly distributed but it is generally located in the more northern sections. The accompanying map (Fig. 9) shows the severity in the areas studies.

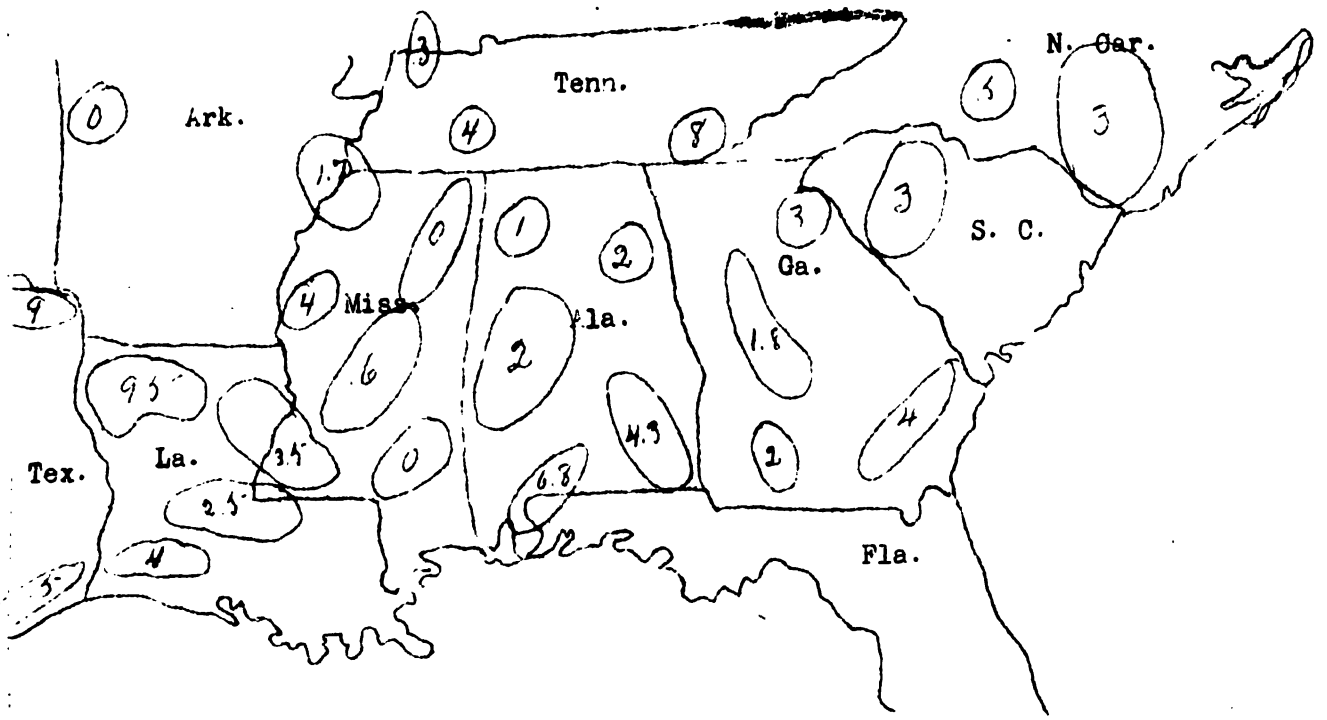

Fig. 7.- Map showing percentages of cotton bolls infected with Colletotrichum gossypii in regions where fields were examined by field assistants of the Plant Disease Survey during September and October 1917.

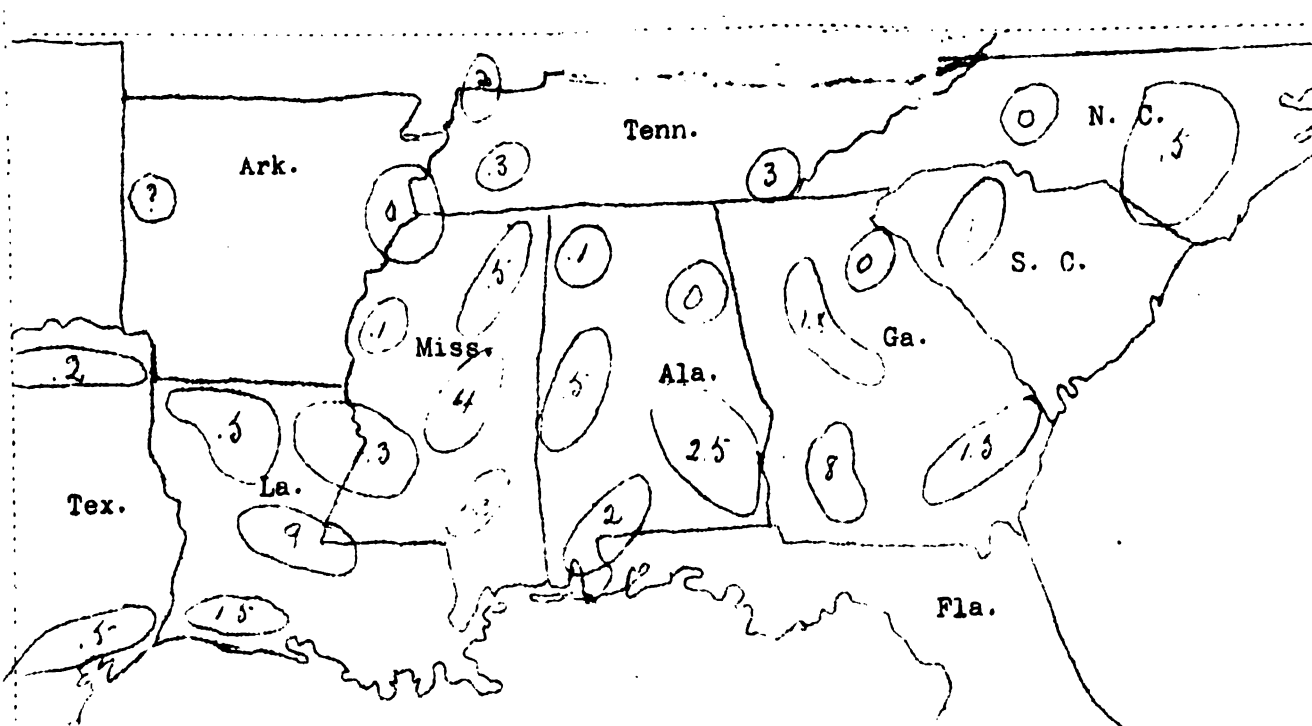

Fig. 7.- Map showing percentages of cotton bolls infected with Diplodia gossypina in regions where fields were examined by field assistants of the Plant Disease Survey during September and October 1917.

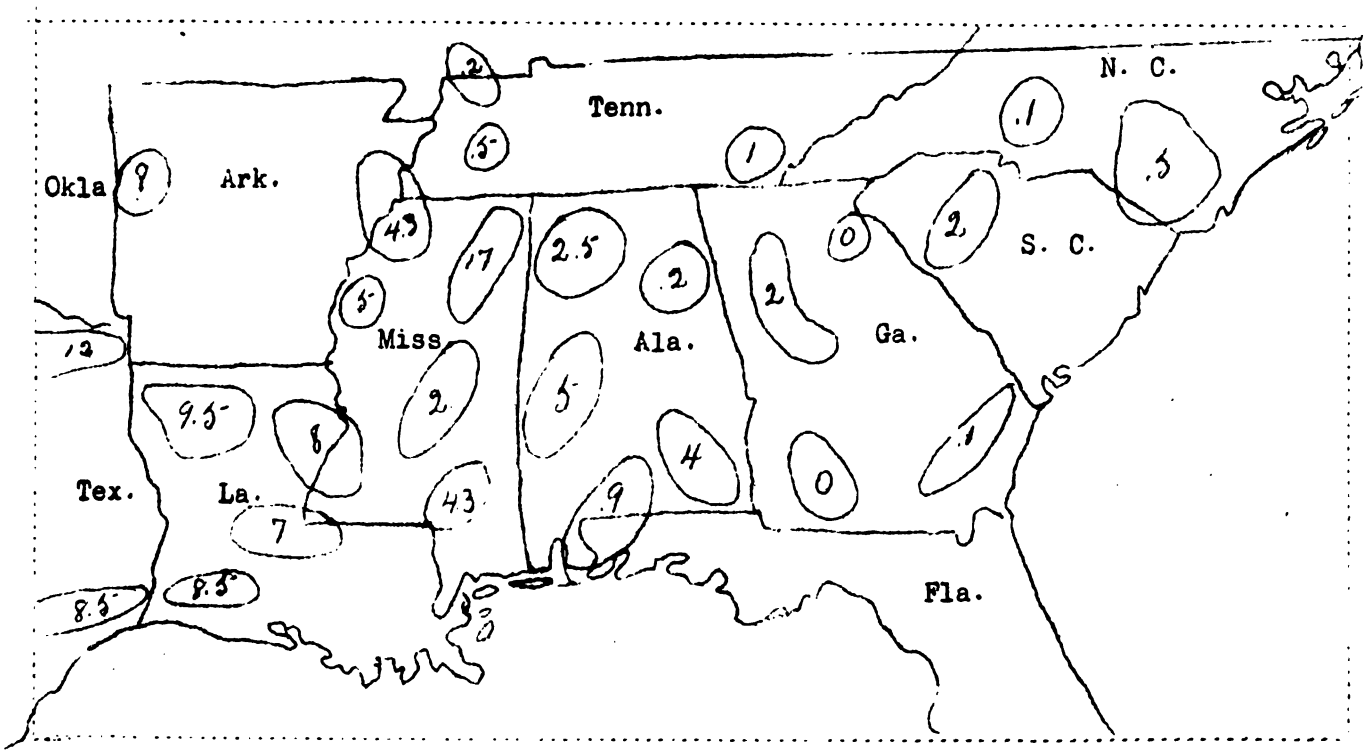

Fig. 9.- Map showing percentages of cotton bolls infected with Bacterium malvacearum in regions where fields were examined by field assistants of the Plant Disease Survey during September and October 1917.

THE PLANT DISEASE BULLETIN

Issued By

The Plant Disease Survey

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Number 8, December 15,

1917.

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

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